

RAGORGAGE ST







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General Safety Rules for Woodworking Machinery

WARNING

The operator must thoroughly read and understand this manual before operating the saw or starting any servicing. All safety and warning instructions should be followed. This manual must be available to all operators.

- 1. For your own safety, read the operation manual carefully. Know your machine. Learn its applications and limitations, and any hazards specific to this machine. All personnel should be trained in the operational procedures and received safety instruction before operating this equipment. If you have not received proper training in the use of this machine, DO NOT OPERATE THIS MACHINE, damage to the equipment or injury to the operator is possible.
- This machine should not be operated without all of the guards in place and safety devices in operation. Removal of any guards or disabling any of the safety devices may result in damage to the equipment or injury to the operator. If any of the guards or safety devices are missing, damaged or not working properly, DO NOT OPERATE THIS MACHINE, notify your supervisor immediately.
- If the operator has any safety concerns or questions regarding the operation of this equipment, DO NOT OPERATE THIS MACHINE, the machine should be locked out and your supervisor notified immediately.
- 4. All Lock Out/Tag Out procedures must be followed before servicing or adjusting this equipment. If you have not received proper training in the Lock Out/Tag Out procedures for this machine, DO NOT OPERATE THIS MACHINE, damage to the equipment or injury to the operator is possible.
- 5. In case of any equipment malfunction or jam the machine should be powered off and locked out before clearing any materials from the operational areas of this machine. Once cleared the reset procedures need to be followed when powering up the equipment. At no time should any of the machine control systems including electrical, hydraulic or pneumatic circuits be manually overridden.
- 6. Check machine for damaged parts. Before continued machine use any damaged guard or part must be carefully checked for proper operation of its intended function. Check all moving parts for proper alignment, check for binding of moving parts, breakage of parts, proper secure mounting, and any other condition that may affect machine operation. Guards or other parts that are damaged must be properly repaired or replaced.
- 7. Machine must be properly grounded.
- 8. Maintain and clean machine at recommend intervals. Intervals may need to be adjusted due to work load or material type to keep machine in top condition. Follow instructions for lubrication,



setup, and changing accessories

- 9. Disconnect machine from power source before, changing accessories, or any servicing activity.
- 10. Avoid accidental starting. Make sure switch is in the off position before connecting to power.
- 11. Remove any tools or loose objects from work surface of machine. Make sure any tools used for adjustment or maintenance are removed from machine before machine is restarted. Make a habit of scanning for tools and scraps every time the machine is started.
- 12. Keep work area clean. Cluttered work areas and workbenches increase the likelihood of an accident.
- 13. Do not use in dangerous environments. Do not use machine in damp or wet locations, or expose them to rain. Keep work area well illuminated.
- 14. Keep children away. All visitors should be kept at a safe distance from work area.
- 15. Make workshop childproof, with padlocks, master switches, or by removing starter keys.
- 16. Do not force the machine. It will function better and safer at its designed rate.
- 17. Use the right tools. Do not force the machine or attachments to do a job for which they were not designed. Contact the manufacturer or distributor if there is any question about the machine's suitability for a particular job.
- 18. Use only recommended accessories. Consult the operation manual for recommended accessories.
- 19. Wear proper apparel. Avoid loose clothing, gloves, neckties, rings bracelets, or jewelry which could be tangled in moving parts. Keep long hair contained to prevent entanglement. Non-slip footwear is recommended.
- 20. Always wear safety glasses.
- 21. Secure the work piece.
- 22. Keep proper footing and balance at all times.
- 23. Do not use machine while under the influence of drugs, alcohol, or any medication.
- 24. Always wear a face mask or dust mask if operation creates excessive dust or chips. Always operate machine in a well-ventilated area and provide proper dust removal.
- 25. Never leave machine running unattended. Turn power off. Do not leave machine until it comes to a complete stop.



Arrival Inspection

WARNING

The operator must thoroughly read and understand this manual before operating the saw or starting any servicing. All safety and warning instructions should be followed. This manual must be available to all operators.

The RazorGage ST positioner, control cabinet, table and legs will ship in a crate. Unpack the items ensuring that all parts are present and free from damage. If any parts are missing or damaged contact your local distributor or RazorGage immediately. Do not assemble or attempt to operate the RazorGage without all components present and in undamaged condition.



Installation

Mounting RazorGage to Your Own Table



Mounting RazorGage to Table Provided by RazorGage







Table Attachment Bracket



When the RazorGage is attached to a saw, a table attachment bracket is used. Use the diagram below to first bolt the table attachment bracket to the saw and then attach the table. After attaching the tables to the saw make sure to square and level the table to the saw. There are leveling adjustment bolts on the table legs and also on the table attachment brackets shown below.



Change the Hand of the RazorGage

The RazorGage is able to be setup for either right or left-hand operation. Use the diagram and instructions below to make the adjustment. No software settings will need to be changed for this procedure.





Mount the Enclosure



Touchscreen Monitor Connections







Motor Cable Connections

The RazorGage Mdrive motor requires either 2 or 3 cable connections, depending on option ordered, to be secured. The power and communications cable connections are required on all options. The I/O cable connection is used on any of the machine interface options.





Setup – PC & Tablet

Once your RazorGage is securely mounted to your machine you begin the first-time calibration process by first adjusting the stop extension. The RazorGage will then be powered up. Next the Mdrive will be indexed. Then home offset will be set and finally the scale factor will be calibrated. Follow instructions below to complete setup of the RazorGage. The RazorGage will be indexed and scaled opon arrival unless the extrusion is shipped in two pieces.

Adjust Stop Extension

To adjust the stop extension, loosen the mounting screws on the stop extension and slide it away from the saw so that it won't hit your saw when you home the machine. With the power off, push the moving carriage toward the motor end of the RazorGage until the carriage hits the internal hard stop. Now extend the stop extension toward the saw blade until it is as close as you want it to be. If you're using the RazorGage as a pusher you will want the stop extension to reach almost all the way to the blade so that your final trim cut doesn't result in much waste. If you're using the RazorGage as a stop then adjust the stop extension so that the distance from the cut to the stop face is less than the shortest part you want to be able to cut. Tighten the stop extension screws.



Power Up the RazorGage

It is very important to note that there are TWO things that must be turned on: The RazorGage AND the PC (or Android)





Calibration Procedure

This section goes over how to set up the RazorGage ST. Although setup procedure is done prior to shipment of the machine, the parameters shown below are adjustable for calibrating and changes in application. Do not change any parameters if you are unsure how it will affect your system.

NOTE: The MDrive is indexed and the scale factor is set at the factory. The RazorGage will need to be indexed and scaled if the MDrive is replaced or on long spliced extrusions. The scale factor may also need modified if the same length parts get incrementally smaller or larger than nominal length as the pusher advances. The home offset will need to be setup to reference the RazorGage to the interfaced saw or other equipment. It may also need adjusted if different length parts, small or large, are off of nominal length by the same amount.

- 1. Turn on control power to the RazorGage tower and start the PC or tablet. The first time the software boots up it will call for the RazorGage stroke length and serial number. Enter these values and press OK.
- 2. Next, it will prompt you to press OK to home to the RazorGage pusher. Once pressed, homing will begin. On initial setup or if the MDrive has been replaced, homing process will likely be interrupted with a message stating the motor will need to be indexed.
- 3. Index the MDrive. (See images at the end of this sections for addition information).
 - a. Press the NEXT button.
 - b. Locate stepper motor gearbox. Remove set screw access cap.
 - c. Press START PROCEDURE.
 - d. Push the RazorGage carriage to the hard stop. Press STEP 2.
 - e. Slowly move the carriage by hand away from the stop until the set screw in the gearbox can be seen. Loosen set screw with 4mm or 5/32" Allen wrench (not ball-end) then leave it in place. This holds the gearbox in position when the motor indexes. Press STEP 3.
 - f. Tighten the screw in the gearbox. Replace access hole plug. Press the OK button to close the completed program.
- 4. Home the RazorGage. Verify that the short backup move at the end of the homing sequence is more than 3/16" but less than 7/16". If not enter the SETUP SCREEN and press the RUN INDEX LOCATOR button. Repeat the index the MDrive instructions from step 3.
- 5. Check that the Stroke under the system parameters is correct. The stroke is the overall length of the RazorGage extrusion minus 24 inches.
- Set the Home Offset. The home offset is the distance from then end of the pusher arm at zero position to the center line of the saw. The calibration screen will help to accurately set this value. As part of the procedure a short piece of material will be cut and measured using calipers.
 - a. Enter in the 5239 for the password followed by the ENTER button.
 - b. Press CALIBRATE. The calibration screen will open and STEP 1 tab will guide through setting of the home offset.
 - c. Enter in a TARGET POSITION. Use a material length that can be accurately measured with calipers.
 - d. Press MOVE TO TARGET button and the RazorGage will move to target position.
 - e. Cut the Part. Make sure there is no one near the saw. Start the saw if not running. Press the CYCLE SAW button to cut the part or manually cycle the saw.
 - f. Accurately measure the cut part. Enter this value into PART MEASUREMENT box.
 - g. Press the SAVE TO HOME OFFSET AND EXIT button if RazorGage scale factor has already been calibrated or CONTINUE TO NEXT STEP to calibrate the RazorGage scale factor.
- 7. Calibrate the RazorGage scale factor. (See images at the end of this section for more



information). The scale factor is the number of stepper pulses per revolution. The calibration screen will assist in accurately setting this value. As part of this step a long part will be cut and measured.

- a. (If just completing the home offset go to step **6c**). Press SETUP SCREEN button to open screen. Enter password of 5239 and press ENTER button.
- b. Press CALIBRATE. The calibration screen will open, the STEP 1 tab is for setting the home offset. STEP 2 guides the user through setting scale factor. Press USE THE CURRENT HOME OFFSET or CONTINUE NEXT STEP to get to STEP 2.
- c. Enter in the 5239 for the password follow by the ENTER/OK button.
- d. Enter in a TARGET POSITION. Use the length just 1-2 inches shorter than the longest stock material. The longer the length the more accurate the scale factor will be.
- e. Press MOVE TO TARGET button and the RazorGage will move to target position.
- f. Cut the Part. Make sure there is no one near the saw. Start the saw if not running. Press the CYCLE SAW button to cut the part.
- g. Use a tape measure as accurately as possible to measure the cut part. Enter this value into PART MEASUREMENT box.
- h. Press the DONE button to save the new scale factor and exit calibration.
- 8. Go to the SETUP SCREEN and set the User Parameters. See descriptions below for more information on these parameters. To change the parameters first enter 90210 as a password followed by the ENTER button. This will unlock the user parameters.
 - a. Speed This is the velocity at which the RazorGage moves. The units are in/sec or mm/sec. Default value is 30 in/sec.
 - b. Accel. The is the acceleration rate of the RazorGage during the move. The units are in/sec² or mm/sec². Default value is 90 in/sec².
 - c. Decel. The is the deceleration rate of the RazorGage as movement comes to a stop. The units are in/sec² or mm/sec². Default value is 90 in/sec².
 - d. Run Current This variable is the percentage of current (amperage) applied to the motor which determines the effective torque of the motor during the RazorGage movement. Default value is 100%.
 - e. Load Speed The speed at which the RazorGage returns to the load position. Default is 30 in/sec.
 - f. First Move Speed This is the RazorGage speed to the first cut position. The speed is purposely reduced when a printer is used so the stock material does not damage the printer as it is initially fed under the unit. Default is 10 in/sec.
 - g. Unload Dist. The unload distance is used when the RazorGage is used as a programmable stop (Main, Auto Calc, Presets, & Work Order). The unload distance is the incremental distance from the current RazorGage position away from the saw the positioner will move when the UNLOAD button is pressed. This allows for extra space to remove the cut material. Default is 5 inches.
 - h. Load Offset The load offset is used when the RazorGage is used as an automatic pusher (APS, Batch, & Autolist modes). This is the length added to the stock material value for additional room to freely load stock material on the RazorGage table. Default is 5 inches.
 - Saw Kerf This value is the length of material the saw blade removes with each cut. The information below demonstrates how to set the saw kerf. Default saw kerf is 0.162 inches.







- j. Clamp Offset The distance from the saw blade or RazorGage zero position to the infeed clamp. Default is 2 inches.
- 9. Check upper and lower movement limits of the RazorGage by using the MOVE TO UPPER LIMIT and MOVE TO LOWER LIMIT to move to these position limits. If the RazorGage stall from running into the end stop, check that the stroke length was entered correctly. If the stroke is correct check the calibration and recalibrate if necessary.
- 10. Check the belt tension by pressing the RUN BREAK-IN button to start break-in routine. The RazorGage will move back and forth from the lower limit to the upper limit. Let the break-in routine run for several minutes. Use the CANCEL BUTTON to stop the operation. If the positioner stalls anytime during this test reduce speed to 30 in/sec. If the speed is already set to 30 then check tensioning of the drive belt.
- 11. If the RazorGage is equipped with a printer press the PRINT SETUP button. On the print setup screen check the CHECK HERE TO ENABLE PRINTING box. Select which printer is used paper label or ink jet. See below for information on printer settings. When settings are complete Press the SAVE button.



Indexing the Mdrive



	Setup Screen									
System Parameter		ser Parameters	Unload Dist	: 5.000		7		8	9	RETURN
Home Offset: 0.00	00	Accel: 90.000 Decel: 90.000	Saw Kerf: 0	.162		4		5	6	Help
■ Metric ● Home Left		Run Current: 100% Load Speed: 30.000	Clamp Offs	et: 2.000		1		2	3	PC Software Manual
 Home Righ ST Extrusion 	t	First Move Speed: 10				-		0	← Backspace	ENTER
Mayata	Maya ta		Pup Index			۲F	Password:			
Lower Limit	Upper Limit		Locator	Calibrate	Ge		X		YY	Save Changes
Home The Positioner	Run Laser Routine	Run Break-In	Printer Setup	Software Options		ent Log				ouro changes

RazorGage Setup Screen



Razorgage Calibration Screen

RAZORGAGE Positioners • Software • Systems

Printer Setup		EVITS THE DDINTED SETUD
Check Here to Enable Printing	SAVE CANCEL	SCREEN DISCARDING ANY CHANGES.
Select Printer Type		SAVES CHANGES AND EXITS THE PRINTER SETUP SCREEN
NO PRINTER		CHECK THIS BOX TO ENABLE PRINTING.
PAPER LABEL PRINTER		SELECT PRINTER TYPE BEING USE EITHER PAPER LABEL PRINTER OR AN INK JET PRINTER.
INK JET PRINTER Print Head Offset 12 Label Offset 0.5	INK JET	SETTINGS FOR THE INK JET PRINTER. PRINT HEAD OFFSET - LOCATION OF THE PRINTER TO THE CENTERLINE OF SAW BLADE. LABEL OFFSET - THE OFFSET DISTANCE FROM THE END OF THE BOARD WHERE THE LABEL IS PRINTED. INK JET PRINTER PORT - THE SERIAL PORT NUMBER THAT THE PRINTER USE S.
Ink Jet Printer Port 0 THE PRINT SETUP SCREEN IS ACCESS FROM MAIN SCREEN >SETUP SCREEN >PRINT SETUP SCREEN ADDITIC EVOLUT TEST F PAPER	NAL SETTINGS FOR THE TON INK JET PRINTER OR RINT BUTTON FOR THE LABEL PRINTER	SETTINGS FOR THE PAPER LABEL PRINTER. FONT SIZE - SIZE OF THE FONT USED. LEFT MARGIN SPACES - SETS THE LEFT TO RIGHT LOCATION OF THE LABEL TEXT. BLANK LINES FROM TOP - SETS THE TOP TO BOTTOM LOCATION OF THE LABEL TEXT.

RazorGage Printer Setup Screen



General Operation – PC & Tablet

The RazorGage software offers 7 different operating screens. Of those 5 operating modes work when the RazorGage is setup as a stop and 4 operating screens work when the Razorgage is setup as a pusher. These different runtime modes offer the flexibility to set the RazorGage up to what suits the application best.

Main Screen

The Main Screen is used to manually entering part lengths. The Main Screen can control the RazorGage as both a stop and a pusher. These two modes that change how the RazorGage is used are absolute mode and incremental mode.

When absolute mode is selected the RazorGage functions as a stop. A target position can be entered by punching in the number and decimal followed by the enter key. Alternatively when using fractions punching in the whole number followed by any of the fraction buttons will move the RazorGage to the selected position. The UNLOAD button will back the RazorGage up allowing room to remove completed part. Pressing this button a second time will return to the previously entered position.

When incremental mode is selected the RazorGage functions as a pusher. The LOAD button is pressed. Then a stock length and trim cut value is entered followed by the GO button. The RazorGage will move to the position of the STOCK LENGTH + LOAD OFFSET (this offset is adjustable from the Setup Screen). A board of the selected length is loaded. Then an incremental value is entered. When the GO button is pressed, first the RazorGage will move to the trim cut position. After saw cut has been made. The GO button is pressed again and the RazorGage will increment forward by the previously entered increment value. The saw kerf is factored into each incremental move so the length of the processed parts will match the entered value. This process is repeated until no more cuts can be made on the board.





Main Screen

Auto Calc Screen

The Auto Calc Screen is useful when an application's parts sizes are calculated using a formula instead of derived from a cut list. With the Auto Calc Screen up to 3 variables can be used in a custom formula to determine a RazorGage position. This formula will be saved as a button with a label and image referenced to it. When the Auto Calc custom button is pressed the position is calculated using the current variable values for X, Y, and Z at the top of the screen and the equation associated with the button. The calculation returned is displayed as the part length and the RazorGage will move to that position. To create a new button, press the DEFINE button then select an unused button. The Auto Calc Entry Screen will open up. Enter in the equation which can include multiple operators and parentheses if necessary. Enter the caption label for the button. To use a graphical image for the button, press BROWSE FOR IMAGE and select an image file. Press Save to save changes to the selected button. Hundreds of these custom buttons can be created and used. When all the buttons on the one page are used up simply PAGE + to goto the next. The UNLOAD button is used to back the RazorGage up allowing room to remove completed part. Pressing this button, a second time will return to the previously calculated position.





Auto Calc Screen & Auto Calc Entry Screen

Auto Pusher Screen

The Auto Pusher Screen is an operating mode where cut patterns can be defined to a bar of stock material of a desired length and saved as a CSV file. These saved files can then be opened as needed. To setup a bar file enter in the bar stock OAL, the Load Pos, and Lead Trim length in the Bar Settings. Then to add cuts to the bar locate the Add New Cuts settings to enter the quantity and length followed by the ENTER key. Repeat this until the bar is completely populated with desired cut lengths. The Status box will display the remaining length of the bar factoring in the lead trim, home offset, and current cuts. After the bar file has been setup, the part cuts making up the bar are displayed on the left side of the screen. When setup is complete the LOAD button is pressed and the RazorGage pusher will move to the load position. Once the stock material is loaded and the cycle initiated, the machine will continue to push the material and cut parts to the lengths on the active bar. It will continue until the all bar cuts are completed or the cycle is cancelled. The Auto Pusher Screen allows cutting of multiple bar stock pieces simultaneously using the Stacked setting. Whether one bar or multiple bars are selected, as parts are cut it will track this in the quantity of completed parts. Please note before running multiple bars of stock material make sure the saw has enough capacity and necessary saw adjustments (i.e. clamp pressures, clamp flows, saw cycle speed, etc.) have been made. Automatic ink jet or label printing is an option with Auto Pusher. More information on Auto Pusher Screen is shown below.



Auto Pusher Setup Screen





Auto Pusher Runtime Screen



Work Order Screen

Workorders can be downloaded to your PC RazorGage with the Workorder Screen. Press the OPEN WORKORDER button to find a file to open whether it is on the RazorGage PC or on a shared network drive. Once a file is open, the headings in that file will be displayed on the left-hand column of the screen and the values on the first line of the list will be placed next to their corresponding heading. If you have an existing file format you wish to use, just email it to RazorGage and we'll set up the Workorder Screen to accept it. If you wish to create a file in Microsoft Excel, you just create a cut list with Line #, Length, and Quantity as the first three columns, then populate up to seven more columns with whatever information you want. The headings will be displayed as shown below with the data for that column next to the heading.

With the Work Order Screen, the RazorGage can function as either a stop or a pusher. When Absolute Mode is selected the RazorGage functions as a stop. In Absolute Mode an offset can be referenced. Pressing the MOVE TO POSITION button will move the RazorGage to the position of current line of the workorder. As parts are cut the remaining part quantity on the line of the workorder will be tracked either automatically with the Tool Safe switch mode box checked or manually by pressing the PART WAS CUT button. When the quantity of the current line reaches zero the next line item of the workorder will be called. The UNLOAD button can be used after each cut to assist in unloading the part by backing the stop up a few inches (unload distance is adjustable in the settings).

When Incremental Mode is selected, the RazorGage will function as a pusher. Press the LOAD button to enter in the board or bar length and the trim cut length and press GO. The RazorGage will move to the entered Stock Length + Load Offset (adjustable on the Setting Screen). After the board is loaded, pressing the GO button will index the RazorGage to the first position of the current line in the workorder. The part is removed from the remaining quantity when the PART WAS CUT button is pressed. After a finished part has been remove, pressing the GO or MOVE TO NEXT POSITION button will increment the RazorGage to the next position in the workorder. With each incremental move of the saw kerf is factored in. When the quantity of the current line reaches zero then next line item of the workorder will be called. The LOAD button is pressed again when the board is used up and the next one needs to be loaded. The process is repeated until the workorder is completed. If the Tool Safe mode box is checked the processed part is automatically deducted from the quantity and the RazorGage automatically advances after the Tool Safe switch transitions from the off to on state.









Work Order Entry Screen



Presets Screen

The Presets Screen is for an application where the RazorGage is used as a stop and part lengths are selected by individual buttons. With the Presets Screen customizable buttons can store various part lengths referenced by a label. There can 56 buttons on each of 4 pages that can be setup. Once a button is setup simply press the customized button and the RazorGage will move to that position. Since the Presets Screen uses the RazorGage as a stop an offset can be referenced if needed. After the machine tool the RazorGage is interfaced with has cycled, the Unload button is used to back the stop up a specified distance (adjustable in the Setup Screen). This allows room to remove the completed part. A preset button can be setup by pressing the SET A PRESET button and selecting a button to modify. A window will popup where a label and a position value can be entered. Press the OK button to finish the setup.

Current Pos: 0	Current Pos: 0.000		Page 1		e 1	Print Dimension		OFF Target	
Part#1 (35.875)	BOARD 48 (47.625)	0	0	0	0.	0	0	Main Screen	RETURN TO THE MAIN SCREEN.
0	0	0	0	0	0	0	0	Page 1 Page 2	THE PRESENT SCREEN IS CAPABLE OF SCORING 4 PAGES OF PRESETS. THE PAGE 1-4 BUTTONS SWITCH BETWEEN
0	0	0	Part#20 (12.625)	0	0	0	0	Page 3 Page 4	THE 4 PAGES OF SAVE PRESET VALUES. THERE ARE 56 PRESET BUTTONS ON FACH PAGE THE PRESET BUTTONS.
0	0	0	0	8	0	0	0		WILL MOVE THE RAZORGAGE STOP TO THE DIMENSION STORED IN THAT PRESET.
0	0	0	0	0	0	0	0		IF AN OFFSET IS USED THIS BUTTON OPENS THE LIST OF SAVED OFFSETS TO SELECT FROM.
0	0	0	0	0	0	0	0	Offset =NONE Set a Preset	THIS BUTTON OPENS THE EDIT SCREEN WHERE ANY PRESET BUTTON CAN BE SELECTED MODIFIED WITH A NEW NAME
0	0	0	0	0	0	0	0	Unload	AND PRESET VALUE.
									SPECIFIED DISTANCE ALLOWING ROOM TO REMOVE THE COMPLETED PART.

Presets Screen

Current Pos: 0.000				•	Page 1			Print Dimension		OFF Target 🛑		
1	Part#1 35.875)	BOA (47	RD 48	n		0	0	n	0	0	Main Screen	
					-						Page 1	
	0		0	0		0	0	0	0	0	Page 2	
	Entry Science					Part#20					Page 3	
	Phone arter a lab	of is the buris	(nay be left Slark)		-	(12.625)	U	UUU	ENTER THE LABEL FOR THE SELECTED			
	Pease arter the o	actual Position N	r the bullon		en la				PRESET.			
							0	0	ENTED TH		POSITION VALUE	
	7	8	9	CANCEL.					FOR THE SI	ELECTED PR	E SET.	
	4	5	6			0	0	0	0	0		
	1	2	3	ENTERIOR							Offset =NONE	
	1.	0	BackSpace			U	0	0	U	0	Select a Button to Set	
	0		0	0		0	0	0	0	0	Unload	



Presets Setup Screen

Batch Parts Screen

The Batch Parts Screen is designed for applications that demand cutting a large quantity of the same length parts. With batch mode an user can setup parts of varying part numbers, lengths, and/or material type. The created parts are saved as a text file (default path C:\Batch Parts\[part#].txt). After the part files have been created, they are added to a parts list to be selected from. Stock material overall length is entered along with a desired quantity. The RazorGage will be moved to the load position. Once the stock material is loaded and cycle is initiated the machine will continue to push the material and cut parts to the same length. This will continue stopping only when the next stock material needs loaded, desired part quantity was reached, or the cycle is cancelled. The Batch Parts Screen will allow cutting of multiple, stacked bar stock pieces at once. As it cuts it will track this in the quantity of completed parts. Before running stacked bars make sure the saw has enough capacity and any necessary saw adjustments (i.e. clamp strokes, clamp pressures, clamp flows, saw cycle speed, etc.) have been made. More information on Batch Parts Screen is shown below.



RazorGage Setup Screen





Batch Parts Setup Screen



Batch Parts Runtime Screen



Autolist Screen

Autolist Screen is useful when an operation is using design software to determine a list of part sizes used in making their products. After running this design software parts file through the Parts List Processor, the RazorGage parts list file created can be utilized by the Autolist software. Autolist takes this parts list file and sorts it by first material, then width, then thickness, and lastly by length longest to shortest. This is the default sorting arrangement for the part groups but can be easily modified to better fit an application. After a parts list file is open in Autolist, a sorted group of parts, or cutlist, is selected. Stock material length is entered and load out is requested. The run screen comes up and the RazorGage moves to the load position. The bar(s) of stock material are loaded on the table in front of the pusher. Based on the length of the stock material and the cutlist, Autolist will optimize cuts using the entire list of remaining parts in the cutlist to efficiently populate the stock material cuts to maximize yield and minimize the amount of scrap produced. Once stock material is loaded and cycle is initiated the machine will start pushing the stock material into position and cut parts from the cutlist. As parts are cut the software keeps track of the quantity left. When all quantities of a part size are completed it is crossed out. The RazorGage will continue feeding and cutting parts until the next piece of stock material needs loaded, the cutlist is completed, or the cycle is cancelled. Below describes the printer setup, parts list file, and runtime screens for Autolist.

Autolist does require a software license in order to use. Contact your local distributor or RazorGage about obtaining a license.



Autolist Label Setup Screen





Autolist Cutlist Setup Screen

14		-			PUSHER MO	DE - RUNNING A BAR			
	DONE	PART	WIDTH MATERIAL	THICKNESS	LENGTH ROOM NAME	ROOM NUM CABINET NAME	CABINET NUM MANUAL SCRIBE	Running a Bar	
1	NO	Middle Stile	1.5 Solid Wood	0.8125	5.5 Room 1	1 Top Cabinet (Stove	6 1 1		
2	NÓ	Middle Stile	1.5 Solid Wood	0.8125	5.5 Room 1	1 Top Cabinet (Stove	6 1 1		THE CONTROL BUTTONS FOR BUNNING & BAR
3	NO	Middle Rail	1.5 Solid Wood	0.8125	5.5 Room 1	1 Base 4 Drawer	5 1 1	LOAD	THE CONTROL BUTTONS FOR RUNNING A BAR
4	NO	Middle Stile	1.5 Solid Wood	0.8125	5.625 Room 1	1 Base 4 Drawer	5 1 1	OUT	
5	NO	Middle Stile	1.5 Solid Wood	0.8125	5.625 Room 1	1 Base 4 Drawer	5 1 1		LOAD OUT - THIS INDICATOR DISPLAYS WHEN
6	NO	Right Stile	1.5 Solid Wood	0.8125	6.625 Room 1	1 Top Cabinet (Stove	6 1 1		THE PAZOPGAGE IS MOVING TO LOAD POSITION
7	NO	Left Stile	1.5 Solid Wood	0.8125	6.625 Room 1	1 Top Cabinet (Stove	6 1 (1		THE RAZOROAGE IS MOVING TO EDAD TO SHITCH.
8	NO	Middle Rail	1.5 Solid Wood	0.8125	6.75 Room 1	1 Base 4 Drawer	5 1 1	CANCEL BUN	
9	NO	Middle Rail	1.5 Solid Wood	0.8125	6.75 Room 1	1 Base 4 Drawer	5 1/1	Contraction of the second s	GO - AFTER LOADING THE NUMBER OF BAR
10	NO	Middle Rail	1.5 Solid Wood	0.8125	6.75 Room 1	1 Base 4 Drawer	5 1 1		STOCK PIECES INDICATED IN THE LIPPER LEFT
11	NO	Middle Rail	1.5 Solid Wood	0.8125	6.75 Room 1	1 Base 4 Drawer	5 1 1		CODVED DESCO THE DUTTON TO CTART THE
12	NO	Left Exp St				1 Top Cabinet (Stove)	6 1 1 1		CORNER, PRESS THIS BUTTON TO START THE
13	NO	Right Stile				1 Base 4 Drawer	5 2 2		MACHINE CYCLE PROCESSING THE BAR WITH
14	NO	Left Stile	1.5 Solid Wood	0.8125	9.5 Room 1	1 Base 4 Drawer	5 2 2		THE CUTS IN THE FILE.
15	NO	Top Rail	1.5 Solid Wood	0.8125	10.25 Room 1	1 Base 4 Drawer	5 2 2		
16	NO	Bottom Rail	1.5 Solid Wood	0.8125	10.25 Room 1	1 Top Cabinet (Stove	6 1 1 1		
17	NO	Bottom Rail	1.5 Solid Wood	0.8125	10.25 Room 1	1 Top Cabinet (Stove	6 1 1 1		CANCEL RUN - THIS BUTTON WILL ABORT THE
18	NO	Bottom Rail	1.5 Solid Wood	0.8125	10.25 Room 1	1 Base 4 Drawer	5 2 2		CYCLE EXITING TO THE SETUP SCREEN.
						THE CURR SHOWN HEI QUANTITIES ARE COMP THE CUTLIS	ENT CUTLIST GROUP RE. AS THE PARTS A ARE TRACKED AND V LETED THE Y ARE CROS T.	STATUS IS RE CUT THE VHEN PARTS SED OFF OF	THE BAR STOCK DIAGRAM SHOW THE PARTS THAT WILL BE CUT OUT OF THE BAR STOCK. THE RED LINE ON LEFT IS THE LEADING TRIM AND ON THE RIGHT IS THE HOME OFFSET OR END TRIM. THE GAPS BETWEEN THE PARTS SHOW THE SAW KERF. THE STATUS OF THE CYCLE IS DISPLAYED BY VELLOW AND RED DOTS. THE VELLOW INDICATES THE POSITION OF THE PARTORDAGE
(1	2 3	4 5 8	7 8	9 10 1	12 13 14	15 16	17 18	PUSHER AND THE RED DOTS SHOW THE COMPLETED CUTS.
read	ing inm							End mith or Home Offset	

Autolist Runtime Screen



Setup – Android

Setup with the Android controlled RazorGage is much like the PC control version. The stop extension will be adjusted and then the controls will be powering up. When the RazorGage is homed for the first time the Mdrive will need to be indexed. Finally, the calibration will take place with the setting of the home offset or saw kerf and the scale factor.

1. Adjust the Stop Extension



To adjust the stop extension, loosen the mounting screws on the stop extension and slide it away from the saw so that it won't hit your saw when you home the machine. With the power off, push the moving carriage toward the motor end of the RazorGage until the carriage hits the internal hard stop. Now extend the stop extension toward the saw blade until it is as close as you want it to be. If you're using the RazorGage as a pusher you will want the stop extension to reach almost all the way to the blade so that your final trim cut doesn't result in much waste. If you're using the RazorGage as a stop then adjust the stop extension so that the distance from the cut to the stop face is less than the shortest part you want to be able to cut. Tighten the stop extension screws.

2. Cut a Short Piece of Material & Measure with Calipers.

From the Main Screen using the RazorGage as a stop cut a short piece of stock material and measure is with calipers. Take note of the intended length and the actual length of the part cut.

3. Open Setup Screen



4. Check the Stoke





5. Index the MDrive





6. Set Home Offset or Saw Kerf



7. Calibrate Scale Factor





General Operation – Android

Main Screen – Android

The Main Screen is used for manually entered part lengths. The Main Screen can control the RazorGage as both a stop and a pusher. The two modes that change how the RazorGage is used with the Main Screen are absolute mode and incremental mode.

In absolute mode, a target position can be entered by punching in the number and decimal followed by the enter key. Alternatively when using fractions punching in the whole number followed by pressing the FRACTIONS button followed by the desired fraction will move the RazorGage to the selected position. The UNLOAD button will back the RazorGage up allowing room to remove completed part. Pressing this button a second time will return to the previously entered position.

When incremental mode is selected the RazorGage functions as a pusher. The LOAD button is pressed. Then a stock length and trim cut value is entered followed by the GO button. The RazorGage will move to the position of the STOCK LENGTH + LOAD OFFSET (this offset is adjustable from the Setup Screen). A board of the selected length is loaded. Then an incremental value is entered. When the GO button is pressed, first the RazorGage will move to the trim cut position. After saw cut has been made. The GO button is pressed again and the RazorGage will increment forward by the previously entered increment value. The saw kerf is factored into each incremental move. This process is repeated until no more cuts can be made on the board.





Cutlist Screen – Android

Cutlists can be created or downloaded to your Android tablet with the Cutlist Screen. Press the OPEN FILE button to find the cutlist CSV file you wish to open. Cutlist files from a network drive or cloud storage will need to be save to the download folder on the tablet to be used. Once you selected a file to open the cutlist will be displayed on the screen. The cutlist file can be edited by selecting a line item and pressing EDIT LIST. Editing options of adding a line, deleting a line, or editing a line are available. A cutlist file can be created in the RazorGage software by selecting CREATE NEW FILE. Quantity can be edited individually through the edit menu or all together by selecting SET ALL REM. QTY which will allow you to change all quantities at once. Select a line item by touching it and highlighting it yellow. When a line is selected the RazorGage will move into position for that part length. As a part is cut pressing the PART CUT (-1) button will track the complete part by removing one from the quantity of the selected cutlist item. When the current line item quantity reaches zero the next item in the list will be automatically selected and the RazorGage will move to that position. The cutlist doesn't need to be completed in order and at any time a different line item can be selected to work from.



Cutlist Screen



Presets Screen - Android

The Presets Screen is for an application where the RazorGage is used as a stop and part lengths are individually selected buttons. With the Presets Screen customizable buttons or list items can store various part lengths referenced by a label. A preset button can be setup by pressing the ADD NEW ITEM button. A window will popup where a length and label can be entered. When editing an existing button, the same Edit Presets Parameter window will open to make changes. Press the SAVE button to finish the setup. Once a button is setup simply press the customized button or list item and the RazorGage will move to that position.



Edit Preset Parameters Screen



Basic Machine Interface

The RazorGage has several interface options to make it operate with different types of machinery. The correct interface option allows the processing machine tool (i.e. saw, drill press, punch press, notcher, shear, router, etc) to work with the RazorGage safely to create accurate parts. The Basic Machine Interface options include Tool Safe, Tool Safe with Air Safety, Tool Safe & Machine Enable, Cyclone BMI, BMI+ AutoCycle, SUP, and CPO.

Tool Safe – Limit Switch

The Tool Safe option uses a limit switch on the process machine that when depressed indicates to the RazorGage software that the machine tool is in a safe position for movement of the positioner to occur. The switch is mounted on the process machine in a way that the switch turns on when the cycle is completed and the machine tool is retracted so it's clear for the RazorGage to move. Only when the tool safe switch is active(closed) can movement of the RazorGage occur. If the switch opens while the RazorGage is in motion the RazorGage comes to an abrupt stop and a motion error occurs. In certain software screens that allow semi-automatic to fully automatic operation, the RazorGage will automatically move to the next position after sensing that the Tool Safe Sensor has opened and closed within a certain timeframe.







Tool Safe – Pressure Switch

The Pressure Switch Tool Safe option uses a switch on the process machine to indicate to the RazorGage that the tool is in a safe position for movement to occur. This pressure switch is plumbed into the process machine's pneumatic circuit in a way that the pressure switch detects pressure when the cycle is completed and the machine tool is retracted so it's clear for the RazorGage to move. Only when the tool safe switch is active(closed) can movement of the RazorGage occur. If the switch opens while the RazorGage is in motion the RazorGage come to an abrupt stop and a motion error occurs. In certain software screens that allow semi-automatic to fully automatic operation, the RazorGage will automatically move to the next position after sensing that the Tool Safe Sensor has opened and closed within a certain timeframe.



The BMI P2E has one Normally Open and one Normally Closed contact. In this case the air signal is absent when the saw is up (safe). Since the RazorGage is looking for a closed contact when the saw is safe, we tied the RazorGage Tool Safe input wire to the Normally Closed contact.



Tool Safe with Air Safety

The Tool Safe with Air Safety option uses a switch and a valve to complete the interface with the process machine. The switch, usually a limit switch or pressure switch, is mounted on the process machine in a way that the switch come on when the cycle is completed and machine tool is retracted so it's clear for the RazorGage to move. Only when the tool safe switch is active(closed) can movement of the RazorGage occur. If the switch opens while the RazorGage is in motion the RazorGage come to an abrupt stop and a motion error occurs. The Air Safety valve is to be plumbed in line with the process machine air supply. While the RazorGage is in motion the valve is off, removing compressed air supply to the process machine, so that it cannot be cycled by the operator. When the RazorGage come to a complete stop the valve will shift, suppling compressed air to the machine, and allowing the machine to be cycled.



TOOL SAFE SWITCH



Tool Safe & Machine Enable

The Tool Safe & Machine Enable option uses a cable to connect a switch and a relay to complete the interface with the process machine. The Tool Safe switch usually a limit switch, pressure switch, proximity sensor, or relay contact is mounted on the process machine in a way that the switch come on when the cycle is completed and machine tool is retracted so it's clear for the RazorGage to move. Only when the tool safe switch is active(closed) can movement of the RazorGage occur. If the switch opens while the RazorGage is in motion the RazorGage comes to an abrupt stop and a motion error occurs. The Machine Enable relay normally open contact is to be wired to the enabling circuit of the process machine. While the RazorGage is in motion the relay is off opening the enable circuit of the machine so that it cannot be cycled by the operator. When the RazorGage comes to a complete stop the relay will turn on, closing the Machine Enable relay contact, completing the enabling circuit of the machine, and allowing the machine to be cycled.



MACHINE ENABLE RELAY

RAZORGAGE MINI ENCLOSURE

OUL SAFE SWITCH



Cyclone BMI

The Cyclone BMI option uses relays connected by a cable to the interface the RazorGage with the Cyclone 600 Upcut Saw. The RazorGage's Tool Safe circuit is wired to a relay output of the saw. When the saw cycle is completed and clamps and saw blade are retracted, the saw's output turns on signaling to the RazorGage that it is clear to move. Only when the Tool Safe saw output is active(closed) can movement of the RazorGage occur. If the Tool Safe output opens while the RazorGage is in motion the RazorGage come to an abrupt stop and a motion error occurs. The Machine Enable relay normally open contact is to be wired to the enabling circuit of the Cyclone 600 Upcut Saw. While the RazorGage is in motion the relay is off, opening the enable circuit of the saw, so that it cannot be cycled by the operator. When the RazorGage comes to a complete stop the relay will turn on, closing the Machine Enable relay contact, completing the enabling circuit of the saw, and allowing the Cyclone 600 Upcut Saw to be cycled.



CYCLONE 600 SAW ENCLOSURE

RAZORGAGE MINI ENCLOSURE



BMI+ Auto Cycle

The BMI+ Auto Cycle option used to interface the RazorGage with a machine tool for automatic operation. This option includes two 24VDC single solenoid 4-way valves. One valve will control the machine's clamp cylinder and the other the advances the tooling (i.e. saw blade). When the solenoid is energized the spool shifts to divert compressed air from port 1 to port 4. When the solenoid is at rest air flows from port 1 to port 2. The supply connects to port 1 on the valve. The retract side of the clamp and saw cylinders will be connected to port 2 on their respected valves. The advance side of the clamp and saw cylinders will be connected to port 4 on the valve. Also included are two limit switches one is mounted in a manner for tool safe (i.e. saw blade retracted) and the other for tool unsafe (i.e. saw blade advanced).



Autocycle I/O timing can be adjusted in the Setup Screen. The Saw Parameters frame contains a value for Timer1. The Autocycle sequence starts by energizing the CLAMP VALVE solenoid which is intended to engage clamps. Immediately after the CLAMP output is set, TIMER 1 begins to count down. This timer is intended to give the clamps time to clamp the part. Adjust TIMER 1 to allow enough time to adequately clamp the part without so much delay that unnecessary time is wasted. When TIMER 1 counts down the SAW VALVE is energized, causing the saw (or punch, drill, or other tool) to extend. The SAW VALVE is de-energized when the TOOL NOT SAFE sensor is activated. Typically, this sensor is placed to detect that the saw (or punch, drill, or other tool) is fully extended. At this point the SAW VALVE is de-energized and the saw retracts. When the TOOL SAFE SENSOR is made, typically when the saw is fully retracted, the clamp output is de-energized causing the clamps to retract. If your saw cycle is extremely slow, such as would be the case sawing through a thick piece of aluminum or steel, there is another timer which may come into play. This timer is called the SawTimeout_Seconds and is set in the config.ini file located in the folder C:\PositionerRuntimeFiles. If you get a saw timeout error due to very long saw cycle times then you may need to adjust this timer to a larger value.





SUP

The SUP option used to interface the RazorGage with a saw for automatic operation. This option uses a Tool Safe (saw retracted) input along with a saw extend input. The SUP also has 2 outputs one to control clamping on the saw and the other to initiate the saw cycle. These inputs & outputs are wired to switches and valves mounted on the saw using a 12-pin interface cable. For safety with the automatic function of this option the saw E-stop is tied into the RazorGage's safety circuit.

Autocycle I/O timing can be adjusted in the Setup Screen. The Saw Parameters frame contains a value for Timer1. The Autocycle sequence starts by energizing the CLAMP VALVE solenoid which is intended to engage clamps. Immediately after the CLAMP output is set, TIMER 1 begins to count down. This timer is intended to give the clamps time to clamp the part. Adjust TIMER 1 to allow enough time to adequately clamp the part without so much delay that unnecessary time is wasted. When TIMER 1 counts down the SAW VALVE is energized, causing the saw to extend. The SAW VALVE is de-energized when the TOOL NOT SAFE sensor is activated. Typically, this sensor is placed to detect that the saw is fully extended. At this point the SAW VALVE is de-energized and the saw retracts. When the TOOL SAFE SENSOR is made, typically when the saw is fully retracted, the clamp output is de-energized causing the clamps to retract. If your saw cycle is extremely slow, such as would be the case sawing through a thick piece of aluminum or steel, there is another timer which may come into play. This timer is called the SawTimeout_Seconds and is set in the config.ini file located in the folder C:\PositionerRuntimeFiles. If you get a saw timeout error due to very long saw cycle times then you may need to adjust this timer to a larger value.

СРО

The CPO option used to interface the RazorGage with a saw for automatic operation. This option uses a Tool Safe (saw retracted) input. This is wired to a switch mounted on the saw. The CPO also has 1 output which is pulsed to initiate the complete saw cycle. The output is wired to a valve mounted on the saw. The RazorGage I/O wiring to the saw is completed using a 4-pin pico interface cable. For safety with the automatic function of this option the saw E-stop is tied into the RazorGage's safety circuit.

Autocycle I/O timing can be adjusted in the Setup Screen. The Saw Parameters frame contains a value for Timer1. The CPO Autocycle sequence starts by energizing the CYCLE VALVE solenoid which trigger the saw cycle. When TIMER 2 counts down the CYCLE VALVE is de-energized. When the saw cycle is complete the TOOL SAFE SENSOR will come on and the RazorGage can move to next position. If your saw cycle is extremely slow, such as would be the case sawing through a thick piece of aluminum or steel, there is another timer which may come into play. This timer is called the SawTimeout_Seconds and is set in the config.ini file located in the folder C:\PositionerRuntimeFiles. If you get a saw timeout error due to very long saw cycle times then you may need to adjust this timer to a larger value.



Machine Adjustments



The operator must remove from and lock out all power sources to positioner before servicing.

Belt Tension Adjustment

The belt tension may need to be adjusted after re-assembling a long RazorGage that has 2 sections of extrusion or if the motor gearbox is replaced. To adjust the belt, find the end of the RazorGage opposite the motor. Next, locate the 2 mounting bolts on the pulley assembly. Refer to the pictures below. Loosen but don't remove these two bolts. Then on the end cap of the extrusion is the jack bolt for the pulley assembly bracket. Turning this bolt clockwise will tighten the belt and counter-clockwise will loosen it. Adjust the belt just until the slack and droop is taken out of the top section of the belt. **Do not over-tension**. When adjustment is finished retighten the 2 mounting bolts on the pulley assembly bracket.





Replacement Parts List

ITEM	RGX#	DESC				
1	RGX02052	NUC PC				
2	RGX01640	DDR3L RAM				
3	RGX00036	SOLID STATE HARD DRIVE				
4	RGX00009	MDRIVE STEPPER MOTOR				
5	RGX00119	MDRIVE POWER CABLE				
6	RGX01154	MDRIVE COMMUNICATION CABLE				
7	RGX00378	MDRIVE I/O CABLE				
8	RGX01957	Gearbox for units after 4/1/18				
9	RGX01609	Gearbox for units before 4/1/18				
10	RGX00795	24VDC POWER SUPPLY, 0.63A, 120-240V INPUT				
11	RGX00146	SAW ENABLE RELAY (CUBE RELAY REPLACEMENT ONLY)				
12	RGX02186	INTERFACE RELAY, SPDT, 24VDC				
13		RS232 TO RS485 COMMUNICATIONS BOARD				
16						
17						
TOOL SAFE	LIMIT SWITCH OPTION	J				
25	RGX02112	LIMIT SWITCH				
TOOL SAFE	PRESSURE SWITCH OP	TION				
25	RGX00725	PRESSURE SWITCH				
TOOL SAFE	AND AIR SAFETY					
TOOL SAFE	AND MACHINE ENABL	E				
CYCLONE BI	МІ					
BMI+ AUTO	CYCLE					
ļ						
SUP	1	 				
СРО						
	A full list of fie	ld replaceable parts can be accessed at our web site:				
	https://razorgage.com/product-line/replacement-parts/					



Troubleshooting - Electrical Schematics









Tool Safe with Air Safety





Tool Safe with Air Safety

































CPO – Page3



Troubleshooting Guide

	Description	Possible Causes	Corrective Action		
1	MOTION ERROR (STALL) DURING PUSHER BAR RUN.	 Bar stock or pusher arm are physically bound up. 	• Press BACK PUSHER UP button. Remove the source of the bind and press the RE-SEND THE LAST MOVE button to resume operation.		
		 The RazorGage speed is set too high. 	 Press the RE-SEND THE LAST MOVE button to resume operation. After bar is completed or if motion error reoccurs, go to the SETUP SCREEN and check the user parameter speed. Set the speed to 30 or less. 		
		 The RazorGage accel and/or decel is set too high for the application. 	• Press the RE-SEND THE LAST MOVE button to resume operation. After bar is completed or if motion error reoccurs, go to the SETUP SCREEN and check the user parameters accel & decel. Set each to 90 or less.		
		• The RazorGage run current is set too low for the application.	• Press the RE-SEND THE LAST MOVE button to resume operation. After bar is completed or if motion error reoccurs, go to the SETUP SCREEN and check the user parameter current. Set the current to 100%.		
		The RazorGage drive belt is tensioned too tightly.	• Press the RE-SEND THE LAST MOVE button to resume operation. After bar is completed or if motion error reoccurs, check the drive belt tension and loosen the belt tension if it is too tight. Check RazorGage scale factor anytime belt tensioning is adjusted.		
2	MOTION IS LOCKED OUT.	• MDrive tool safe input lost	Check MDrive I/O cable connection is tight.		
	A MOVE WAS REQUESTED WHILE THE SAW WAS NOT IN A SAFE CONDITION FOR PUSHER MOVEMENT.	The retract switch opened during the RazorGage move.	• Check the saw retracted prox. switch and adjust if necessary. If adjustment is ok, check the cable connection and wiring back to RazorGage tower enclosure. Press OK to recover from the error. The recovery from this error exits the runtime screen back to the setup screen.		
	THE REQUEST HAS BEEN CANCELLED.	• A move was requested with the SAW DONE MOVE TO NEXT on-screen button.	• Press OK to recover from the error. The recovery from this error exits the runtime screen back to the setup screen.		
3	E-STOP FAULT	• E-stop switch is active.	Reset E-stops switches. Press Power ON button on the RazorGage panel.		
		• PC lost USB connection to Joystick board.	• See section <i>Troubleshooting Estop PC Connection</i> .		
		• USB Joystick board lost wired connection to MCR contact.	• See section <i>Troubleshooting Estop PC Connection</i> .		
		• USB Joystick board Button#10 input failed.	• See section <i>Troubleshooting Estop PC Connection</i> .		
4	MACHINE IS NOT IN 'SAFE' POSITION	• MDrive tool safe input lost	• Check MDrive I/O cable and make sure the connection is tight.		
	MOTION IS LOCKED- OUT. ENSURE THE I/O CABLE ON THE MDRIVE	• Tool extend switch out of alignment.	• Check tool extend switch alignment make sure switch is ON in extend position. Adjust if necessary.		
	IS TIGHT AND THE TOOL-SAFE SWITCH IS ACTUATED	 Machine tool was cycle was triggered during RazorGage move. 	 Make sure RazorGage has complete its move before triggering machine tool. 		
5	TOOLSAFE SWITCH IS	Lost MDrive tool safe input	Check MDrive I/O cable and make sure the connection is tight.		



CURRENTLY OFF. IT MUST BE ON TO START A CYCLE.	• Tool extend switch out of alignment.	• Check tool extend switch alignment make sure switch is ON in extend position. Adjust if necessary.
	• Loose connection or open in Tool Safe switch wiring	• Check the Tool Safe switch cable and wiring on the both on switch and running back to RazorGage enclosure for any loose or open connections. Check MDrive I/O cable wiring any loose or open connections.
	• Failed Tool Safe switch.	• Use to Control Test Screen to check the status of the Tool Safe (RG Enable) Input. Activate/deactivate the Tool Safe switch and check to see if the RG Enable Input is turning ON and OFF with the switch. If input remains off, replace the switch.
	• Failed Mdrive input.	• Use to Control Test Screen to check the status of the Tool Safe (RG Enable) Input. If ON disconnect the Tool Safe switch from the terminal strip and if the signal stay ON the MDrive input has likely failed. Replace the MDrive.
6 THE TOOLSAFE SWITCH DID NOT TURN OFF WHEN EXPECTED.	• Short in the switch wiring.	• Check the Tool Safe switch cable and wiring on the both on switch and running back to RazorGage enclosure for any damaged insulation or other shorts. Check MDrive I/O cable wires for any damaged insulation or other shorts.
	• Failed Tool Safe switch.	• Check the Tool Safe switch cable and wiring on the both on switch and running back to RazorGage enclosure for any damaged insulation or other shorts. Check MDrive I/O cable wires for any damaged insulation or other shorts.
	• Failed Mdrive input.	• Use to Control Test Screen to check the status of the Tool Safe (RG Enable) Input. If ON disconnect the Tool Safe switch from the terminal strip and if the signal stay ON the MDrive input has likely failed. Replace the MDrive.
	• Cycle time is too slow. Program timed out before switch became unactive.	• Adjust Tool Safe switch so it deactivates faster or speed up machine tool cycle.
7 THE TOOLSAFE SWITCH	MDrive tool safe input lost	• Check MDrive I/O cable and make sure the connection is tight.
DID NOT TURN ON AFTER A SAW CYCLE.	• Tool extend switch out of alignment.	• Check tool extend switch alignment make sure switch is ON in extend position. Adjust if necessary.
	Loose connection or open in Tool Safe switch wiring.	• Check the Tool Safe switch cable and wiring on the both on switch and running back to RazorGage enclosure for any loose or open connections. Check MDrive I/O cable wiring any loose or open connections.
	• Failed tool safe switch.	• Use to Control Test Screen to check the status of the Tool Safe (RG Enable) Input. Activate/deactivate the Tool Safe switch and check to see if the RG Enable Input is turning ON and OFF with the switch. If input remains OFF, replace the switch.
	• Failed Mdrive input.	• Use to Control Test Screen to check the status of the Tool Safe (RG Enable) Input. If ON disconnect the Tool Safe switch from the terminal strip and if the signal stay ON the MDrive input has likely failed. Replace the MDrive.
8 TOOL EXTENDED SWITCH IS CURRENTLY ON. IT MUST BE OFF TO START A CYCLE.	• Short in the switch wiring.	• Check the Tool Extended switch cable and wiring on the both on switch and running back to RazorGage enclosure for any damaged insulation or other shorts. Check MDrive I/O cable wires for any damaged insulation or other shorts.
	• Failed tool extend switch.	• Use to Control Test Screen to check the status of the Tool Extended (Saw Up) Input. Activate/deactivate the Tool Extended (Saw Up) switch and check to see if the Saw Up Input is turning ON and OFF with the switch. If input remains ON, replace the switch.



		-
	• Failed Mdrive input.	• Use to Control Test Screen to check the status of the Tool Extend (Saw Up) Input. If ON disconnect the Tool Extend switch from the terminal strip and if the signal stay ON the MDrive input has likely failed. Replace the MDrive.
9 TOOL EXTENDED SWITCH DID NOT TUI ON WHEN EXPECTED	 Tool extend switch out of alignment. Cycle time is too slow. Program timed out before switch was made 	 Check tool extend switch alignment make sure switch is ON in extend position. Adjust if necessary. Increase the length of the SawTimeout_Seconds timer. This timer can be found in the CONFIG.INI file in following folder on the harddrive C_VPositionerRunTimeFiles\BGST
	 Open or loose connection in the switch wiring. 	 Check the Tool Safe switch cable and wiring on the both on switch and running back to RazorGage enclosure for any loose or open connections. Check MDrive I/O cable wiring any loose or open connections.
	• Failed tool extend switch.	• Use to Control Test Screen to check the status of the Tool Extend (Saw Up) Input. Activate/deactivate the Tool Safe switch and check to see if the Saw Up Input is turning ON and OFF with the switch. If input remains OFF, replace the switch.
	• Failed Mdrive input.	• Use to Control Test Screen to check the status of the Tool Extend (Saw Up) Input. If ON disconnect the Tool Extend switch from the terminal strip and if the signal stay ON the MDrive input has likely failed. Replace the MDrive.
10 REQUESTED POSITIO EXCEEDS THE MAXIMUM TRAVEL	• The requested move is smaller than the offset or larger than the stroke + offset.	 Enter position value that meet these requirements. Position > home offset Position < stroke + home offset Adjust home offset if it is larger than the smallest part needed.



Checking Tool Safe & Tool Extend Input



Troubleshooting E-Stop PC Connection

An E-Stop circuit is a hard-wired system intended to drop power and air whenever any component in the E-Stop circuit changes from closed to open. This circuit cannot rely on software to drop power and air yet it is helpful if the software informs the user that an E-Stop condition is present. On RazorGage systems we use an USB joystick board to bridge the physical switch contact on the Master Control Relay of the safety circuit to the PC through an USB port. When an E-stop is activated, an event in the software will be triggered and the E-Stop screen will be displayed. If your system randomly displays E-Stop screens even though all E-Stop switches are deactivated then it is possible that the software E-Stop circuit is compromised. To troubleshoot this potential problem, find the USB joystick board on the inside of the RazorGage electrical enclosure. The USB joystick board receive its power from the USB connection to the PC. This is displayed by a red power LED on the board. If the red LED is off, check the USB connection both on the joystick board and PC. Use the instructions below in Checking E-Stop Software Input Status to open the Generic USB Joystick Properties. With the E-stop circuit reset, the Button #10 status should be on indicated by a bright red indicator. If the indicator is off, check the MCR normally closed contact and the wiring back to the USB joystick board. If contacts and wiring checks out try moving the plug connector on Button #10 to the connector for Button #1. If the indicator for Button #1 turns on then the USB joystick board has a failed input and will need to be replaced. The pictures on the following pages will lead you through the troubleshooting process. Your enclosure may vary from the one shown in the photos but the basic components and methods will be the same.







Checking E-Stop Software Input Status

If you have more questions about RazorGage products visit our Downloads page and our You Tube channel. Both are accessible from the RazorGage home page, <u>www.razorgage.com</u>. If you would like to discuss an application, feel free to call us at (515) 232-3188.