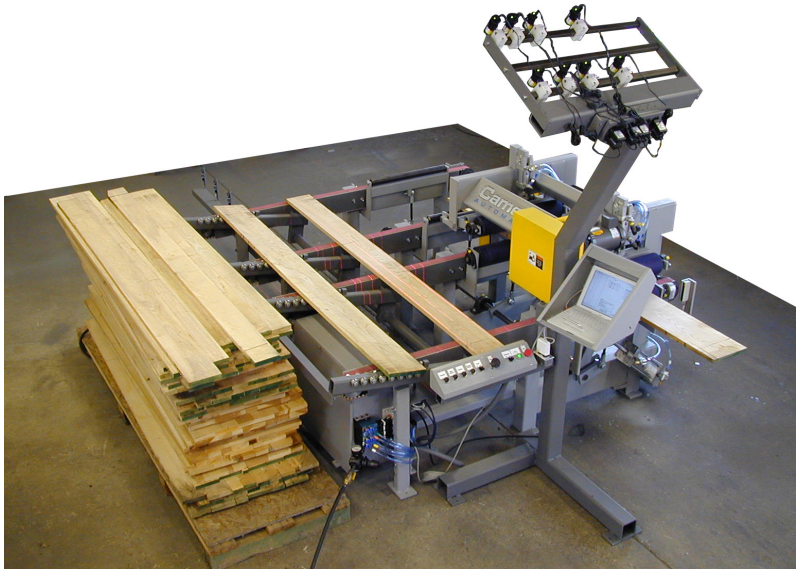
Cameron AUTOMATION

Opti-Rip



Model - #415A-M1

SN -

130 Salt Point Turnpike
Poughkeepsie, NY 12603
Tel: (845)-452-3780
Fax: (845)-452-0764
Email: info@cameronautomation.com
Web: http://www.cameronautomation.com

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INTRODUCTION

Company Introduction

We at Cameron Automation would like to thank you and your company for selecting the Cameron Automation Opti-Rip. With proper care, your Opti-Rip will provide you with many years of reliable service.

This manual contains important information about the installation, operation and maintenance of your Opti-Rip. We urge you to read it carefully to become familiar with the components and features it describes. Following these recomendations will make your cameron machine as trouble free and productive as possible.

This manual is intended for use by anyone working with this machine. It should be kept available for immediate reference so that all operations can be performed with maximum efficiency and safety. Do not attempt to perform maintenance or operate this machine until you have read and understand the information contained in this manual.

Limited Warranty

This supersedes all previous warranties

Cameron Automation guarantees all products of its manufacture to be free of defects in workmanship or material when properly installed, serviced and maintained under normal conditions. **Cameron Automation's** obligation under this warranty is limited to repairing or replacing any part or parts thereof which shall within one (1) year after shipment to the original user, be returned to its factory, transportation charges prepaid, and which **Cameron Automation's** examination shall disclose to be defective.

Cameron Automation assumes no liability for labor charges incidental to the adjustment, service, repairing, or removal or replacement of parts or other losses, or for expense of repairs made outside of its factory, except when made pursuant to **Cameron Automation's** PRIOR written consent.

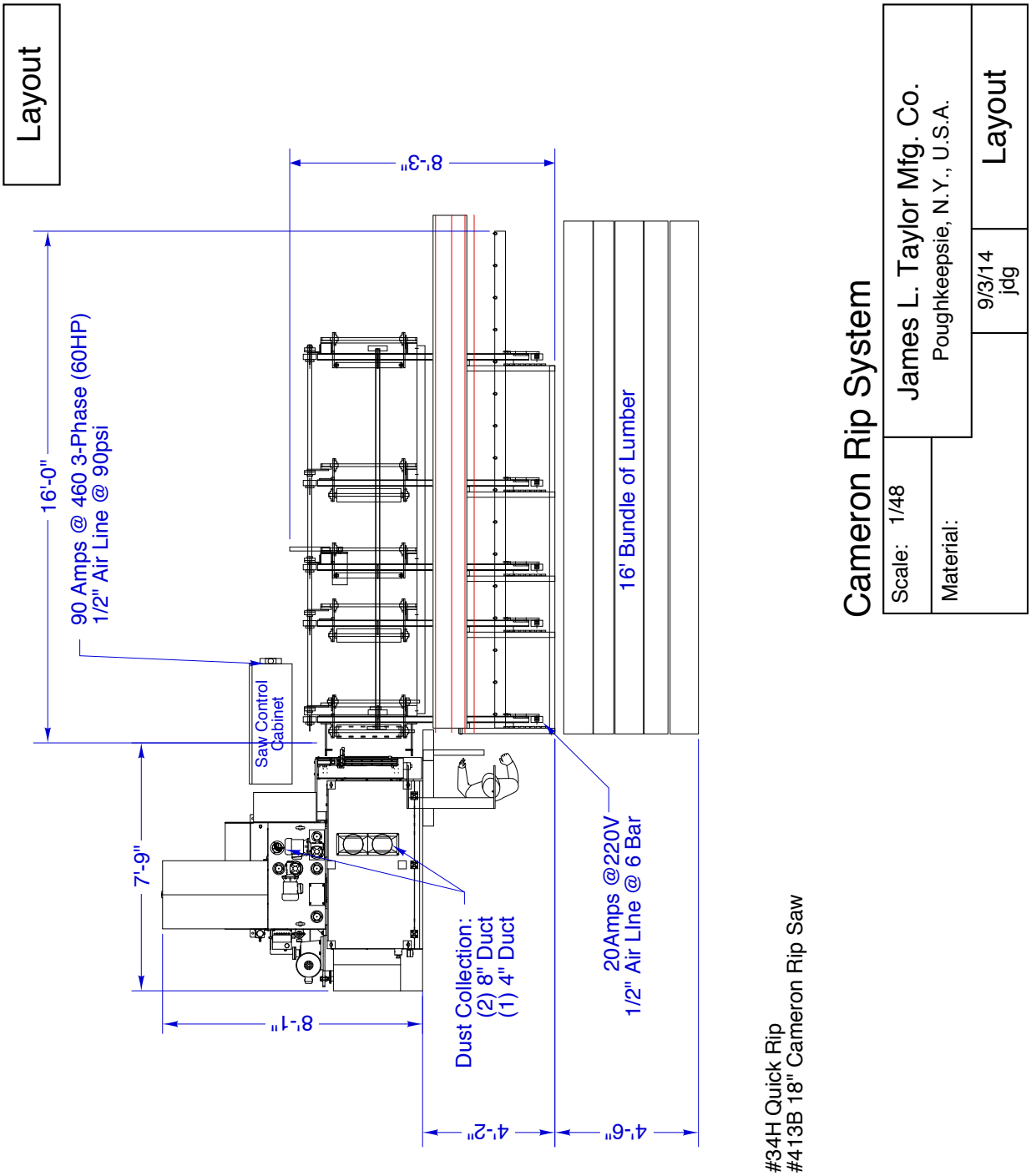
Cameron Automation does not guarantee equipment furnished by us, but manufactured by others, such as belts, electric motors, starters, controls or other electrical equipment or accessories, as they are guaranteed separately by their respective manufacturers. **Cameron Automation** assumes no liability what so ever for any of these parts claimed to be defective or for damages or delays caused by defects beyond making such repair or furnishing duplicate parts within the manufacturer's warranty, nor shall we be liable for any defective material repaired or replaced without our consent.

The foregoing shall constitute the fulfillment of all of our obligations under this warranty and there are no other warranties or guarantees, expressed or implied except as stated herein.

Cameron
AUTOMATION

Machine Requirements and Layout

The Opti-Rip comes in many different configurations. Shown below is a representation of a common configuration.



RULES FOR SAFE OPERATION

Types of Warnings

This is the safety alert symbol. It is used to alert you to potential injury hazards.

Obey all safety messages that follow this symbol to avoid possible injury.

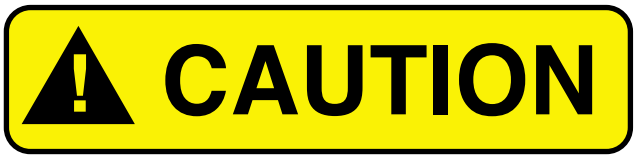
DANGER in white letters on a safety red background with a safety red exclamation point.

This indicates an imminently hazardous situation which, if not avoided, WILL result in death or serious injury.

WARNING in black letters on a safety orange background with a safety orange exclamation point.

This indicates a potentially hazardous situation which, if not avoided, COULD result in death or serious injury.

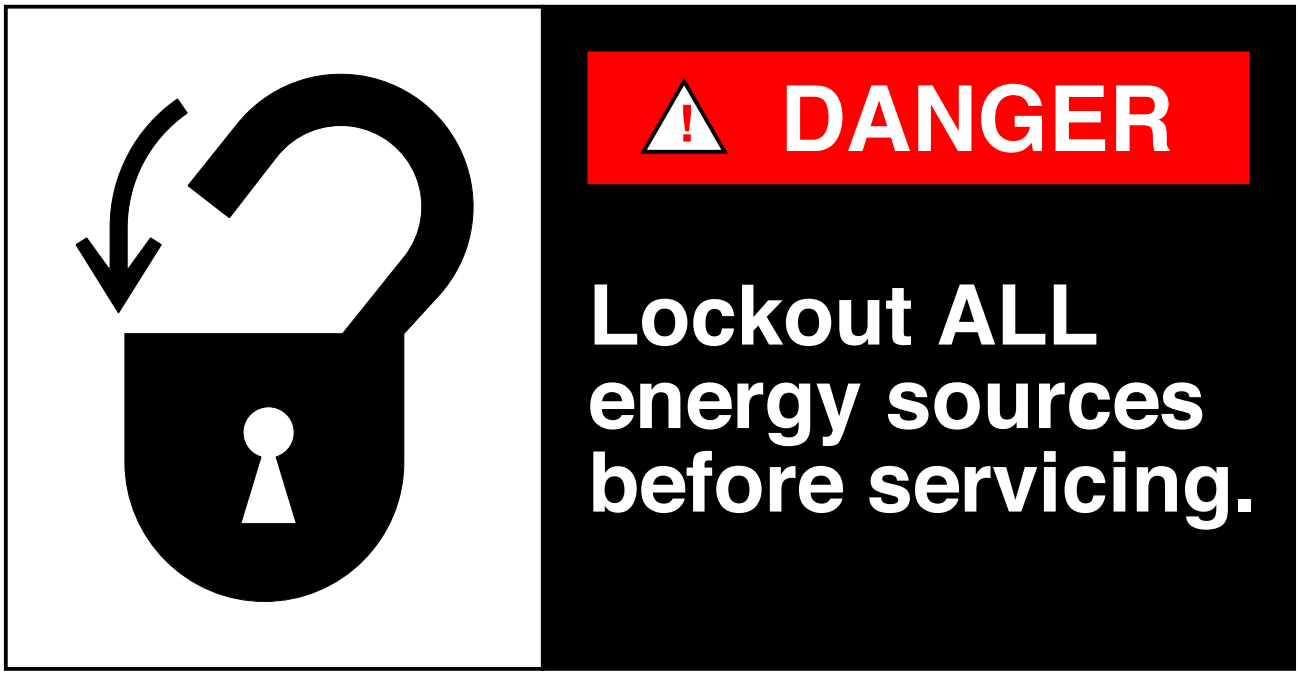
CAUTION in black letters on a safety yellow background with a safety yellow exclamation point.



This indicates a potentially hazardous situation which, if not avoided, COULD result in minor or moderate injury.

General Safety Rules

- Follow lockout procedure before servicing.
- Read and understand manual before operating machine.
- Wear eye protection.
- See the plant supervisor to determine what protective equipment each job requires.
- Follow electrical and fire codes.
- Do not wear loose clothing, jewelry or long hair around operating equipment.
- Keep guards in protective position when machine is operating.
- Keep clear of belts chains and moving parts.

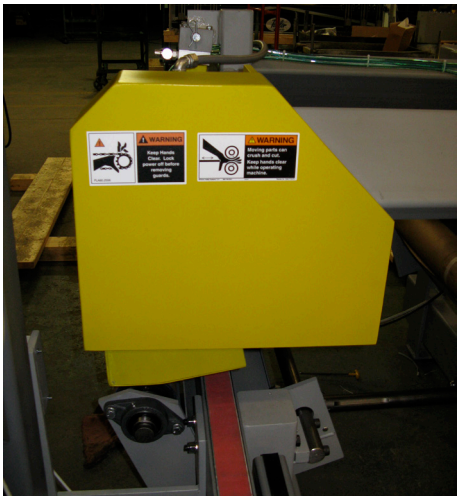


Machine Safety Decals

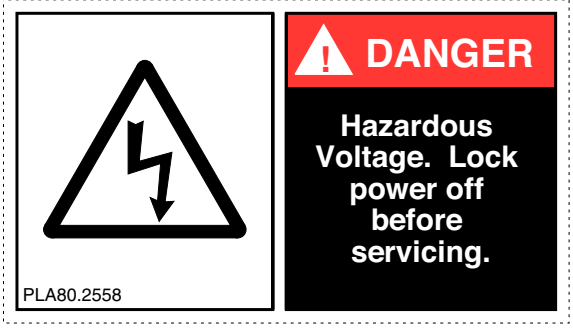
The following warning stickers are some that are used on your machine. Over time, these stickers can become worn and illegible. New stickers can be obtained from:

Cameron Automation
130 Salt Point Turnpike
Poughkeepsie, NY 12603
Tel: (845)-452-3780
Fax: (845)-452-0764
E-mail: info@cameronautomation.com

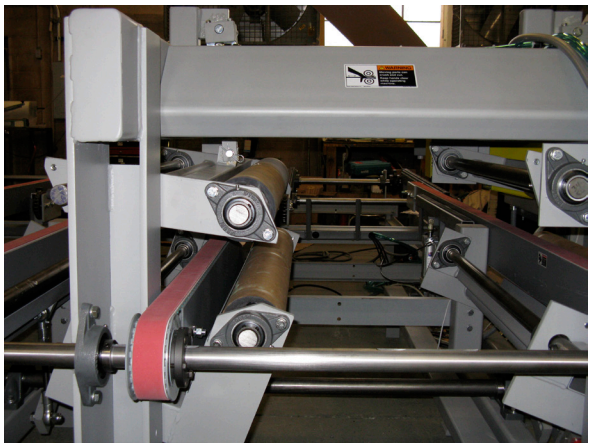
Part Number: PLA80.2556
Description: Chain Warning Sticker
Location: Chain Guards



Part Number: PLA80.2558
Description: Voltage Warning Sticker
Location: Control Cabinet Cover



Part Number: PLA34.252
Description: Pinch Roll Warning
Location: Upper Beam on Pinch Roll Frame

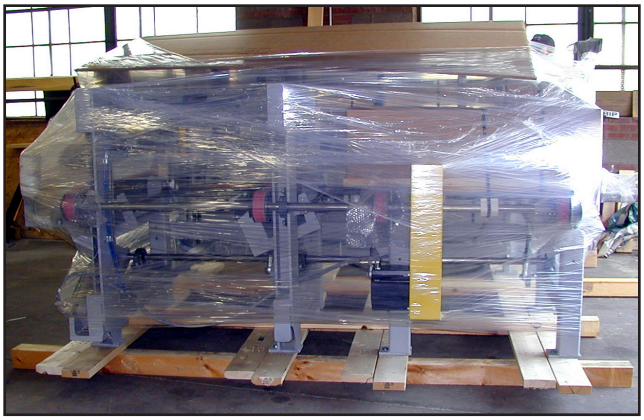


Part Number: PLA.190
Description: Crush Hazard
Location: On Idle Roller Frames

Part Number: PLA34.523
Description: Laser Warning
Location: On the outside of the last belt track.

INSTALLATION

Receiving & Unpacking



Inspect the skid and its boxes for shipping damage.

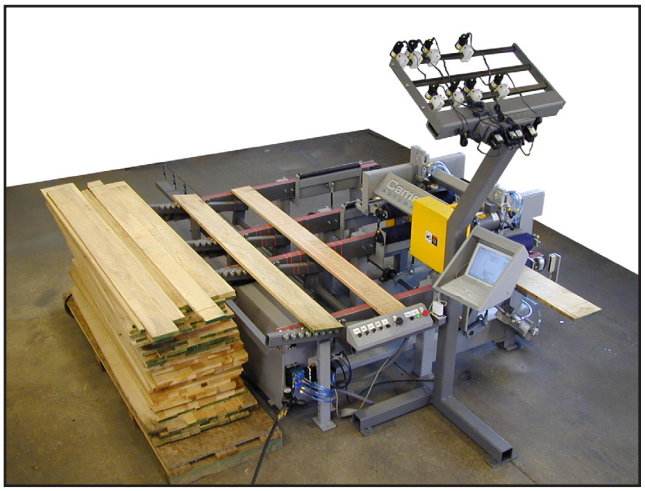
If any shipping damage has occurred, notify the shipping company immediately.

The Opti-Rip has been quality inspected and tested at our factory, then disassembled for compact shipping. The Laser Stand has been strapped to the top of the machine, and the Computer and its mount have been removed and packed away. Depending on the size and configuration of the machine, belt tracks and infeed chains (optional) may be packaged on a separate skid.

The Opti-Rip comes in several configurations. The maximum size for each skid will be: 210" long x 97" wide x 62" high. Max weight: 2150 lbs.

Opti-Rip Assembly

The Opti-Rip has been pre-assembled and run at our factory, then broken into the following major components: The machine section, the laser stand, and the computer enclosure.



Initial Placement

Position the machine in front of the rip saw as shown in the layout located in the "Introduction" section of this manual.

Install the Belt Tracks

On machines made for wider saws, the belt tracks may have been removed for shipping. If the belts are already in place, this step should be skipped.

When installing the belt tracks, make sure to loop a belt over each belt track before bolting it in place. Otherwise, you will not be able to attach the belts. Each belt track attaches to the infeed legs and outfeed legs with the shallow side up. Note that the tracks are numbered.

When mounting track number 1, also install the light curtain mounting brackets in their proper position. When mounting track number 3, also mount the guard for the drive belt.

Tension the belts so that each belt hangs down 1/8" below the bottom of the belt track in the center. You may notice that there is a 1/32" shim between the idler bracket and the belt track on the bolt nearest the end of the track. This will angle the idler out slightly so that when the belt is in tension, it will be pulled back square again. This shim is

important to keep the belt tracking properly.

Position the Roller Arms or Infeed Chains

For Quick-Rips, lower the Roller Arms into position and attach them to the air cylinder at the infeed end of the machine.

For Automated Opti-Rips, position the infeed chains so that the belt track mounting holes line up with the holes on the infeed section legs.

Install the Laser Stand

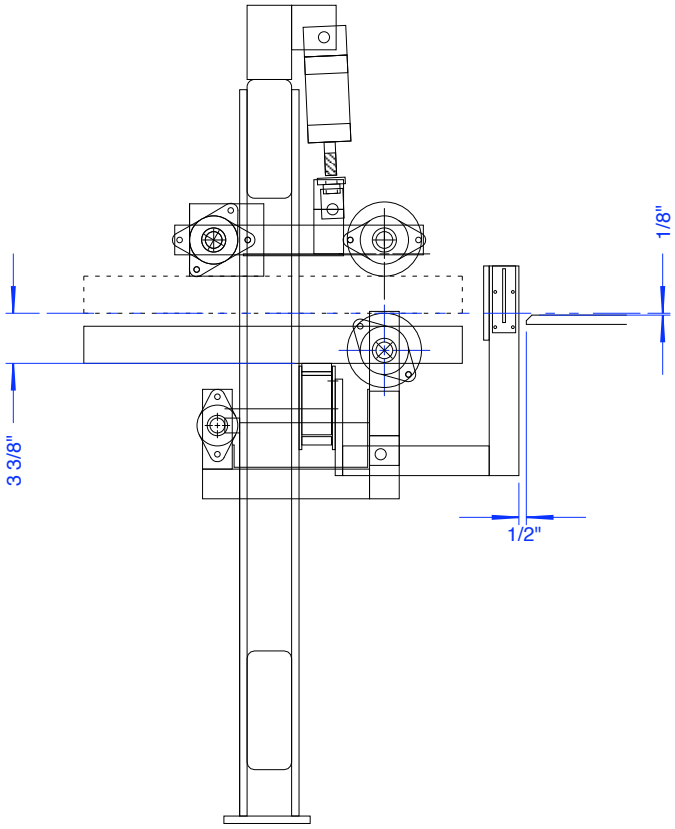
Position the Laser Stand in front of the belt area of the machine as shown in the photo. Attach the operator controls to the horizontal tube. These controls should be positioned side to side, so that the lasers cover the entire section of the belts. It should be positioned front and back so that the back of the controls are 10" from the belt track.

On machines with movable lasers, be sure to position the laser rack such that the moving lasers can reach a position to shine their line 1" from the roller drive guard. This will be very close to the saw.

Note that the laser rack must be square with the belt tracks.

Final Positioning

Position the machine in front of the rip saw so that the polyurethane rollers are approximately centered on the track of the saw. Leave approximately 1/2" between the brackets for the light curtain and the infeed end of the rip saw. Check that the saw has been leveled properly. Place shims (provided) under the Opti-Rip feet such that the bottom of the board will feed 1/8" above the saw feed chain. If you swap the hoses on the lower pinch rolls cylinder temporarily, you can raise the lower rollers without electrical power on the machine. Note that the board will be raised off of the belts by 3 3/8" before it is fed into the saw. Make sure the polyurethane rollers are perfectly square with the feed of the saw. If the ripsaw has any kind of fence on its infeed, this should first be removed.



Position the Laser Stand

Position the laser stand so that the back of the box enclosing the operator controls is 9 3/4" from the first belt track.

Lag the Machine to the Floor

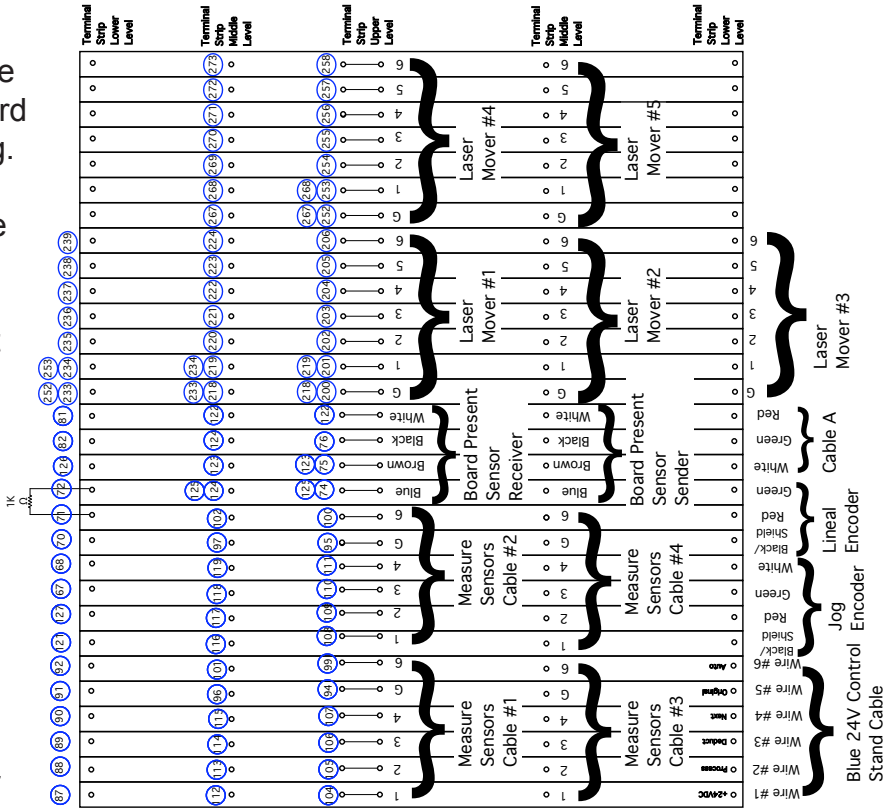
Lag the legs and Laser Stand to the floor. Lag the saw to the floor as well.

Install the Lasers

Mount the lasers on the laser rack. Plug each laser into a power supply. Lasers will be aligned later. Moving lasers should be positioned toward the top of the laser rack and fixed lasers should be positioned near the bottom where they can be easily reached by the operator.

Mount the Computer Stand

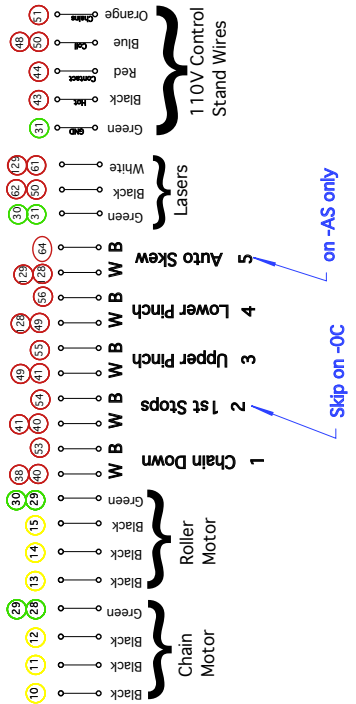
Mount the computer stand onto the laser stand. Run the ethernet cable and power cord through the liquid tight tubing. Plug one end of the ethernet cable into the computer. The other end will plug into the main control box. Plug the power adapter into the outlet on the control stand.



Mount the Measuring Sensors

On machines that were shipped without the belt tracks installed, the measuring bar will also need to be installed.

Mount the measuring sensor bar to the chain section legs using the bolts provided. The sensors will point up toward the bottom of the board. They are positioned between the tracks so as not to interfere with them.



Connect Hoses and Wires

Connect the hoses, if any are loose, to the control box. The hoses are color coded.

Connect the ethernet cable to the upper connector on the right hand side of the control box. Also, connect any loose wires to the control box as well.

When running wires into the control box, run them through the hole in the control box closest to where each respective wire will connect inside the control box. Connect the

wires as follows:

1. Run the two servo cables into the control box and attach them to the servo drive. One cable plugs in, the other attaches to screws on the front of the drive. Match the labels on the wires with the labels on the drive. You may need to detach the ends from the cables briefly to get them inside of the control box. Be certain to reassemble the cable ends exactly as they were.

2. Connect the wires to the terminal strips located in the bottom right hand corner of the control box. Follow the diagram at the right and connect the wires to the terminal strips.

Power Connection

Wire 208-240V, 3 phase power to the disconnect switch on the left hand side of the control box. This power should be protected with 20A FRN, LPN, or equivalent fuses. Run the incoming ground to the chassis of the control box, not to the disconnect switch. In order to ensure that your machine is free from electrical noise, you should ground your machine independently from other machinery. Contact your electrician if necessary.

Turn on the power and air and start the machine by depressing the green button on the Operator Controls. Also press the power button on the computer. Make sure that the air pressure regulator is set in the range between 60 psi and 80 psi.

Check Motor Rotation

Select "Inputs and Outputs" from the "Diagnostics" menu on the computer. Press the 5 key while in the diagnostics screen and the roller feed motor should run. The roller should rotate in the proper direction to feed a board into the rip saw. On machines with infeed chains, use the selector switch on the top of the control box to briefly run the chains. If either of these motors run in the wrong direction, remove power from the machine and swap any two of the black wires connected to the terminal strip from the motor.

Movable Saw Connection (Optional)

Mereen-Johnson 312 "Select-A-Rip":
With power disconnected from the saw, mount the "Digi-One" (included) inside of the Mereen-Johnson control box. Attach the power cable for the "Digi-One" to the 24VDC power supply inside of the MJ Control Box. The wire with the white stripe should attach to the positive (+) terminal and the all black wire should attach to the negative (-) terminal. The Digi-One has been configured at the factory with the proper baud rate to communicate with the saw. It has been set to communicate with the Opti-Rip using IP Address: 10.0.0.78. Run an ethernet cable (included) from the extra port on the back of the Opti-Rip

control box to the Digi-One inside of the MJ control box. Attach the serial cable inside of the MJ control box to the Digi-One.

Choose "Edit System Parameters" from the "Special" menu. Set "Saw Type" to "MJ 312 Select-a-Rip". Choose "Edit Saw". Set the "Saw IP Address" to 10.0.0.78.

Setting an Initial Saw Location

Choose "Edit System Parameters" from the "Special" menu. Enter the password "1234". Using a measuring tape, measure the distance from the stops on the end of the chain conveyor or infeed ramps (with the socket head screws) to the center of the saw blade furthest in on the saw arbor. Enter this distance in the system parameters in the spot labeled "Stops to Saw 1". This value will not be exactly right at this point, but will get us in the ballpark. It will be fine tuned later.

If you are using a system with movable lasers or movable saw blades, while in System Parameters, temporarily set "Laser System Type" and "Saw Type" both to "Fixed". Press "OK" to return to the main screen. Make sure that you change these parameters back to their original settings once the machine setup is complete.

Set up a Simple Arbor

Press the "Setup" button on the computer and enter the information for an arbor setup as explained in the operation section of this manual. Create a setup with a single 1 3/8" rip. Build an arbor for your saw for a 1 3/8" rip, using two blades. Any size rip will work if your saw can't be set to a 1 3/8" rip. Make sure "Auto Skew" is turned off.

Setting the Feed Delay

Select "Edit System Parameters" from the "Special" menu. Set the Feed Delay to .250. DO NOT change any other items on the screen. Press "OK" to exit. Process a board by placing it on the second stops (the socket head screws) and pressing the process button. The Opti-Rip should move the board under the lasers which aren't set to any particular pattern yet. Press the Process button again and the Opti-Rip should move the board to the pinch rollers and the pinch rollers should feed the board into the saw. With the feed delay set at only .250, the board will probably not make it all the way into the saw feed system. Press the Stop button on the Opti-Rip, remove the board, increase the Feed delay by .250, and try again. Keep repeating this procedure until the Feed Delay is long enough that the rip saw takes the material before the Opti-Rip stops feeding it. It is important that the Feed Delay be increased in small increments. If the Opti-Rip feeds for too long a period of time, it will try to jam the material into the saw feed system and the two systems will fight each other, causing premature wear on both machines.

Achieving Parallel Feed

Before setting the lasers, the stops (socket head screws) on the infeed arms or chains must first be set so that they are parallel to the feed of the saw. Place a board against these stops and press the process button. After the board is positioned in the laser section, press the process button again and take note of where the board feeds into the saw. Run the board again and this time move the board left or right using the jog knob so that it will hit one of the saw blades.

Once the board has a straight edge on it, repeat the procedure, this time trying to rip off a 1/4" piece from the straight edge of the board. Measure the width of the piece that was cut off at the leading and trailing ends. If the edges of the piece are not parallel, adjust the stops (socket head screws) so that the piece that is cut off will be parallel.

Repeat this procedure until you can consistently rip a parallel piece off the edge of a board. It is not important at this point that the piece be a particular width, but it must be the same width at each end.

If you have difficulty getting consistent results, make sure the pinch rollers aren't operating too fast and that the top rollers hit the board just before the bottom rollers reach their topmost position. Also make sure the feed of the saw is perpendicular to the pinch rollers. Lumber with internal stress will be difficult to feed consistently.

Laser Setup

Make a "setup board" by finding a 16' board with VERY STRAIGHT AND PARALLEL edges cut on it. Scribe a line on the board exactly one inch in from the leading edge.

Press the "Set Lasers" button on the computer. The computer will prompt you to place the setup board on the stops. Place the setup board on the infeed chains so that the straight edge is firmly against the stops (the socket head screws). Press the "OK" button or return key on the computer and the machine should drop the setup board onto the belts and then move the board in front of the operator station. With the setup board in this position, make sure each laser is vertically plumb and horizontally square with the **lines scribed** on the setup board. The laser setup program that you are in is designed to align the lasers with the saw blades. However, until each laser is plumb and square, leave the computer with the prompt reading, "Position laser #1."

Hang a string and plumb bob above the far end of the setup board to create a vertical string line which is aligned with the line scribed on the setup board.

Now, without moving the plumb bob or the setup board, align each laser one at a time so that the beam is aligned with both the line scribed on the setup board and the plumb line. If

your machine is equipped with movable lasers, these will not slide side to side easily. The motor holding the laser can be overcome by twisting hard on the pulley that's on the output shaft of the motor. Once each laser is plumb and square, press the Stop button on the Opti-Rip and then restart the machine so that the movable lasers will re-home. Follow the instructions in the Operation section of this manual for final laser setup.

If your machine is equipped with movable lasers or the saw has moving blades, edit the system parameters and set the "Laser System Type" and "Saw Type" back to their proper values.

Final Alignment

For the Opti-Rip to operate properly, very careful attention should be given to the following items. It may be necessary to repeat this section a few times in order to get the optimum performance from the machine.

Create an arbor and install it into the saw. Edit the setup on the computer to match the arbor in the machine (see the operation section of this manual.) Make sure the saw kerf in the computer setup matches the actual saw kerf of the blades in the saw.

Put the setup board against the stops and click the "Set Lasers" button again. This time align a laser to each position presented in the laser setup procedure.

Place a board on the stops (the socket head screws) and press the process button. The Opti-Rip should move the board under the lasers and display where the board should be cut. Use a fine pen to mark where each laser line hits each end of the board. At each location, put one mark in the center of the laser line, and two more marks, each 1/8" from the center of the laser line, one on each side of the laser line. Feed the board through the saw by pressing the process button and examine where the board was actually ripped. If the rip pattern is not parallel with the pen marks on the board, adjust the stops (socket head screws) to rotate the board in the proper direction before it is placed on the belts, then follow the above procedure to realign the lasers, then repeat this procedure. If the rip pattern is parallel with the pen marks, but is shifted one way or the other, increase or decrease the "Stops to Saw 1" system parameter. Increasing will cause the belts to move the board farther before the pinch rollers pick it up.

Dismantling:

To dismantle the machine, reverse the Installation (Assembly) instructions.

Machine Disposal:

The components used in the construction of an Opti-Rip are not hazardous or harmful. When the machine has completed it's life cycle, dispose of the materials according to local regulations.

OPERATION

Safety & Training

According to many OSHA, ANSI, STATE, and LOCAL CODES it is the EMPLOYER'S RESPONSIBILITY to:

- Permit only trained and authorized employees to operate equipment.
- Inspect and maintain guards, safety devices, and start/stop controls.
- Instruct, train, and supervise the safe method of work.

Be sure personnel are properly trained and safety rules are clearly understood before operating or performing maintenance!

Opti-Rip Operation

The Opti-Rip System is comprised of the following major components:

The Roller Arms or Infeed Chains deal one board at a time to the belt conveyor.

The laser light array displays a pattern of lines on the board corresponding to the pattern of saws on the saw arbor. These lines indicate to the operator where the current solution will rip the board, allowing him to make intelligent defecting choices.

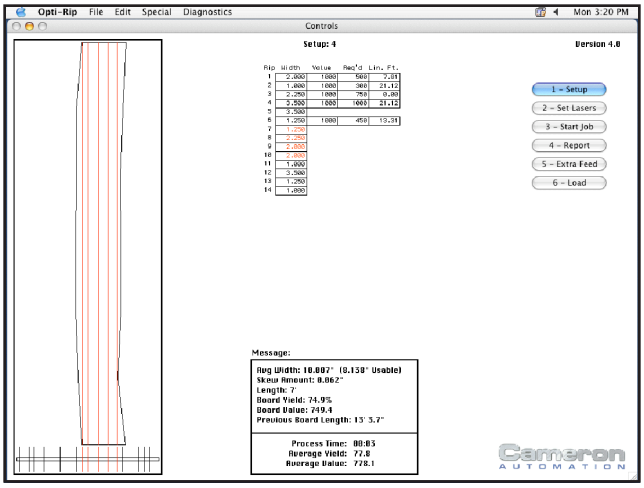
The belt conveyor moves boards from the infeed chains to the laser area in front of the operator station. It then repositions the board under the laser lines at the operators command. Finally, the belt conveyor moves the board from the laser area to the pinch rollers.

The pinch rollers pick the board up off the belt conveyor and feed it into the rip saw.

The control box houses the servo drive and various other electrical components. The operator controls are located in a separate control stand. These controls allow the operator to control the ripping process during a production run.

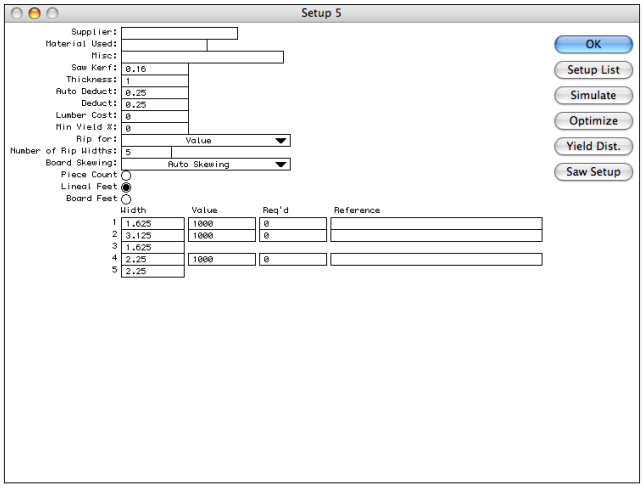
The computer displays the current status of the production run or the current settings and values set up in the system provides a means for the operator to change system values and details of a particular production run.

The Main Window



When the Opti-Rip is powered up, the main screen should be displayed on the computer, and the machine should be ready to run. This screen displays a graphic representation of the saw arbor configuration and the current board being processed. It displays the selected values, required quantities and the cumulative quantities of each respective rip width. It also displays current board information, cumulative values and yields, the values of the auto-deduct and deduct features as well as the process time of the job currently in process.

Edit Setups



By clicking on the "Setup" button or the "1" key, the operator can edit one of the 500 setups available. Setups are numbered from 1 to 500. The reference number of the current setup is displayed in the title bar of the setup screen. Before information can be entered into the setup editing window, a saw arbor must first be configured. To switch from one setup to another, press the "Setup List" button.

Configuring the Saw Arbor

One of the most important preparations that must be done is to assemble the saws on the saw sleeve in the order that will satisfy the following:

1) Provide the proper rip widths.
2) Utilize the lumber to the maximum efficiency.
3) Generate the various rip widths in the

proportional quantities that are consistent with the needs of the production run.

The Opti-Rip system can assist you in setting up arbors to achieve maximum yield/value from the lumber. Refer to the "Arbor Optimization" section in this manual.

Setting Up A Job

The set-up editing window displays the characteristics of the gang rip saw onto which Opti-Rip is installed, specifics concerning the lumber being processed and the ripped stock being produced. The values of any of these items can be changed by positioning the cursor on the value to be changed using the arrow keys, and typing the desired value in its place. If the value entered is larger or smaller than what is allowed, the computer will automatically change it to the minimum or maximum value allowed.

You can return to the main screen at any time by pressing the "OK" button. The changes you made will automatically be saved.
Below is a list of values that can be edited in the edit setup screen:

Supplier - Identifies the lumber supplier.

Material Used - Identifies the species and grade of lumber being processed.

Misc - Space for any additional information pertaining to the job.

Saw Kerf - The amount of wood in inches removed by each of the saw blades. This is determined by tooth width.

Thickness - Identifies in inches the lumber thickness being processed.

Auto-Deduct - The amount in inches that the computer automatically deducts from every board width prior to calculating the best rip combination. This feature helps compensate for consistent dimensional irregularities in a supply of lumber thus reducing operator input. This value is typically increased for longer and/or more crooked lumber. In normal operation the Opti-Rip subtracts 1/2 of the Auto-Deduct value from each side of the board. In "edging" mode, the entire value will be subtracted from the edge to be cut.

Deduct - The amount in inches that is deducted from the computer's calculation of a board's best rip combination when the operator activates the deduct switch. Each consecutive time that the switch is activated, the computer recalculates and displays new rip combinations based on the reduction of usable board width. (This value has no meaning in "edging" mode because the deduct button will not function)

Lumber Cost - The price paid for the lumber being processed in $/thousand board feet (MBF).

Minimum Yield % - If the board being evaluated cannot be ripped with a yield higher than this value, the board will be positioned such that it will be edged with the first (or optionally last) saw.

Rip For - This can be set to either Value or Required. When set to Value, the Opti-Rip will use the value associated with each rip width to determine the most valuable solution. When set to Required, the Opti-Rip will automatically adjust rip values in order to attempt to achieve the required amounts of each rip. Values are adjusted automatically as the job is processed.

Number of Rip Widths - The number of rip widths that will be entered in the table below.

Board Skewing - This determines how boards are skewed. When set to No Skewing, solutions are calculated on the non-skewed positions of the board. When set to Show Skewed Solution, solutions are calculated based on what can be achieved if the boards are skewed by hand. When set to Automatic Skewing, solutions are based on what can be achieved if the boards are skewed, and the skewing is performed automatically (assuming the machine is equipped with Auto-Skew.)

Piece Count / Lineal Feet / Board Feet - This offers the choice of displaying the tallies and required quantities of ripped widths on the operation screen as either piece count, lineal feet, or board feet.

Width - The widths of the ripped stock that the machine will produce during this setup. For rip saws with movable blades, you may enter a random range. For example, entering "2-4" in the width field will allow the machine to produce any size of rip between 2" and 4" in order to maximize yield.

Value - The relative value of each ripped stock width in $/MBF. Opti-Rip will incorporate these values in calculating the most valuable ripping solution. If all values are equal Opti-Rip will calculate the solution resulting with the highest yield.

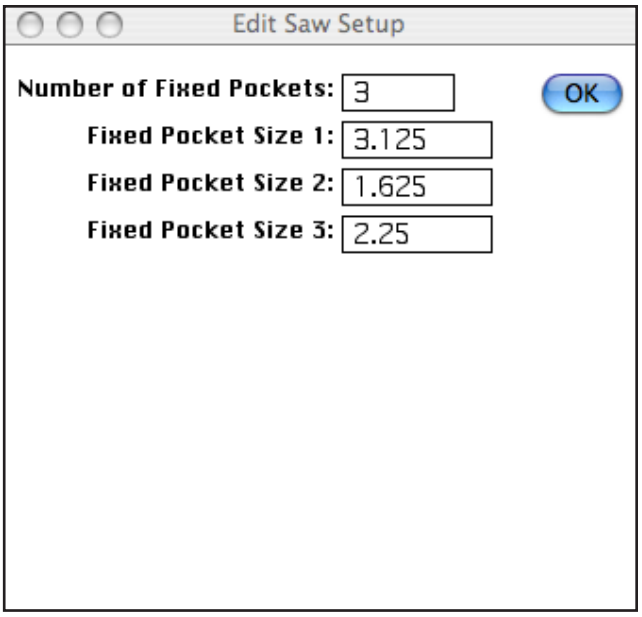
Required- The target quantities desired for each ripped width displayed as either a piece count or lineal footage depending upon the Display Lineal setting.

Reference - An optional description or reference number for each rip.

Rip Width Table

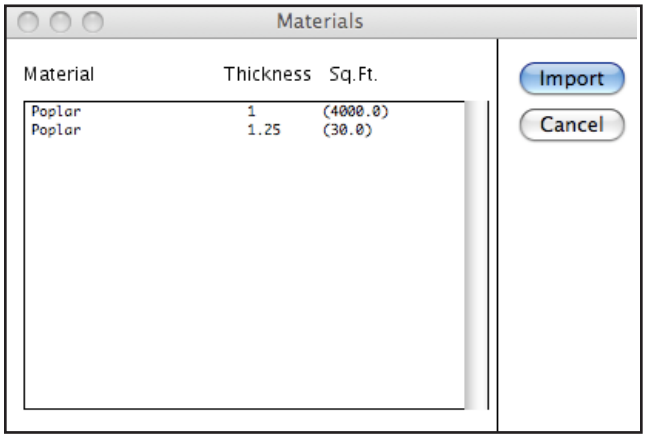
The table at the bottom of the "Edit Setup" screen contains a list of desired rips. For fixed arbor saws, this table also indicates the arbor configuration. The first line represents the pocket furthest in on the saw arbor. A single width will show up multiple times in the list if that width pocket is on the arbor in multiple places.

For moving blade saws, the table contains the desired rip widths, but they don't have to be in any particular order since they don't represent the saw arbor configuration. For these saws, the saw configuration is adjusted in a separate window. Click the "Saw Setup" button from within the "Edit Setup" window to access the saw setup window.



"From Orders"

If you are using the order management feature of the Opti-Rip software, the "From Orders" button will allow you to pull your setup data from the orders that you previously entered. Click the "From Orders" button. This will open a "Materials" window that lists the materials from all of the active orders. Each material to be processed will be listed, separated automatically by thickness. Note that if you stock your lumber in different grades, you must designate the grade in the material name along with the species. The "Materials" window also indicates the square footage remaining to be processed for each material. Note that this total square footage is a totaled from all of your active orders.



Click on the material you are ready to run and then select the "Import" button. This action will automatically populate the "Setup" data from the collection of orders that will be simultaneously run using this one setup. From the "Reference" field, you can determine which orders call for each of the widths to be ripped. Do NOT modify the data in the reference field. After importing the data, you should optimize your saw arbor and confirm that the Saw Kerf, Auto Deduct,

etc. are correct.

Once the job has been entered into the setup, the "OK" button can be clicked to return to the main screen.

Optimization and Simulation

A key step to achieving the maximum yield from your lumber is to optimize the saw arbor and run simulations. See the section called "Arbor Optimization" below.

Laser Setup

Once an arbor has been entered into the setup information in the Opti-Rip computer, the lasers need to be properly positioned to represent the saw arbor pattern.

On machines with only one fixed laser, Laser Setup is not necessary every time the saw arbor is changed, even if the saw has fixed blades. One fixed laser and multiple moving lasers is a special case where the lasers can generate any pattern, regardless of how or where that pattern is created in the saw. On these machines, Laser Setup should be performed periodically to make sure the lasers are still aligned properly.

Make a "setup board" by finding a 12' or 16' board with a VERY STRAIGHT cut edge on it. Scribe a line on the board exactly one inch in from the straight edge.

Press the "Set Lasers" button to choose Laser Setup. The computer will then prompt you to put the setup board on the stops (against the socket head screws). Once the setup board is in place against the stops, press the "OK" button. The setup board will be dropped onto the belts and moved underneath the lasers. For fixed lasers, slide the laser so that it is centered on the line scribed on the setup board. For movable lasers, click on the "Correct" button then enter "1234" as the password. You can then type in a correction amount if necessary. For example, if the laser is off by 1/8", type .125 or -.125 and then press OK and the laser will move automatically. Once the laser is aligned, press the OK button and the board will be moved so that the line on the setup board is where the next laser should be. Continue until all lasers are properly positioned.

On the Opti-Rip, it doesn't matter which fixed laser is used to represent which saw. If the first saw is a fixed saw, the first laser usually won't move since the first saw in on the arbor is always in the same place.

Starting a Job

Pressing the "Start Job" button automatically clears all tallies and statistics for the active set-up number. This should be done before the start of every job.

Loading the Opti-Rip

Boards should be placed on the Roller Arms or Infeed Chains. End alignment of the boards is important. All boards should overhang the belt closest to the operator far enough so that the pinch rollers will pick it up, but not so far that the board will hit the Operator Controls or lineal measurement bar when traversing to the pinch rollers. On machines with infeed chains, an inventory of boards should be maintained at all times before the first stops. These boards help to push a board over the stops when it is singulated.

Operator Controls

A panel of simple controls are available to the operator during a production run.

Emergency Stop Button: This red mushroom button shuts off all electrical power to the machine. This button locks in the down position and needs to be twisted and reset before the Start button will operate properly.

Start Button: This green button powers up the machine. It should light up when the machine is powered on.

Conveyor Switch: On Automated Opti-Rips, this switch powers the infeed conveyor chains. On Quick Rips with no infeed chains, this switch does nothing.

Process Button: This button causes the board currently under the lasers to be moved to the pinch rollers and fed into the saw. At the same time, the next board is positioned under the lasers.

Next Pattern: This button should be pressed when the operator is trying to rip around a defect in the board. This button tells the computer to move the board under the lasers so that the next best ripping solution based on the weighted values of the ripped widths is displayed. Each time this button is pressed, another rip solution is displayed, in descending order of value until there are no more possible solutions. The "next pattern" button will not function in "edging" mode thus the board will need to be positioned solely by the jog knob.

Deduct: This button will be pressed by the operator when the operator wants a narrower solution because the usable width of the board is less than the measured width of the board. Each time this button is pressed, the computer subtracts the deduct amount set for the current setup from the width of the current solution displayed and moves the board to a new solution that is narrower than the result. The deduct button will not function in "edging" mode thus the board will need to be positioned solely by the jog knob.

Original: This button causes the computer to move the board back to the original solution presented after the board was first measured. The Next Pattern and Deduct buttons can then be used again after the Original button if desired. If the board is already in the original position when the Original button is pressed, the board will be moved so that it can be edged by the first saw.

Auto Switch: This switch puts the Opti-Rip in automatic mode. To start automatic operation, the operator needs to turn on the Auto switch, then press the process button. Under automatic operation, boards will automatically be fed to the saw without the operator having to press the process button for each board. After the board is positioned under the lasers, the operator has a certain amount of time (adjustable via the system parameter screen) to use the jog knob and/or press the Next Pattern or Deduct buttons before the board is automatically sent to the saw. If the operator presses one of the buttons, the operation will stop until he presses the process button again.

Jog Knob: The jog knob is used by the operator to fine tune the adjustment of the board when it is under the laser lights. The Opti-Rip will automatically center the board on the laser pattern selected based on the measured width of the board. The board, however may need to be shifted to one side of the other to obtain the best rip pattern. The belts move the same speed and direction as the knob is turned. The operator should NOT use the knob to move the board to another rip pattern. If the operator does this, the board will still rip where the lasers last indicated, but the computer will think the board is still under the original solution and will tally the board improperly. To change from one solution to the next, the operator should press the Next Pattern or Deduct button.

Keyboard Controls: Pressing the 1 through 6 keys on the computer keyboard while the program is in the main window, will cause the computer to act as though you clicked on a button with that corresponding number. For example, pressing 1 will bring up the Edit Setup screen.

Pressing the A through V keys will cause the machine to go directly to a particular ripping solution. The A key will tell the machine to choose the widest possible solution that starts with the first saw. The B key gives the widest solution that starts on the second saw, and so on.

Pressing the W key tells the machine that the usable width of the board is wider than what is being displayed. Each time the W key is pressed, it adds the deduct value to the usable width.

Printing a Report

By pressing the "Report" button, the data collected from the current production run will be displayed in report form. A detailed description of the data contained in this report can be

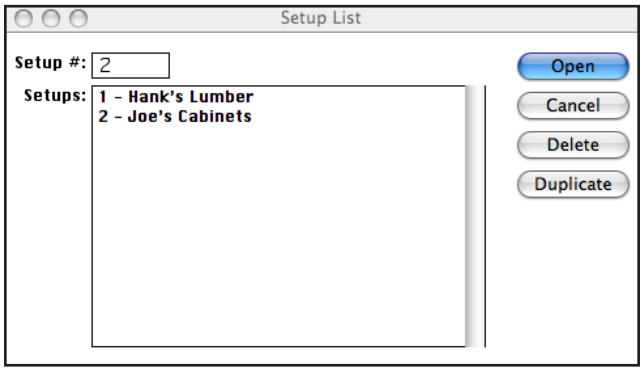
found at the end of the Operation section of this manual.

Extra Feed

From time to time, a board may feed into the saw, but not get picked up by the saw feeding mechanism. When this happens, clicking the "Extra Feed" button on the main screen will cause the machine to pinch and feed the board a second time.

Setup List

Each setup contains the setup information for a particular job. Production tallies and board data collected are also associated with setups which means that you can start a job on one setup, switch to another setup at any time to run a different job, and switch back to the original setup to resume the first job.

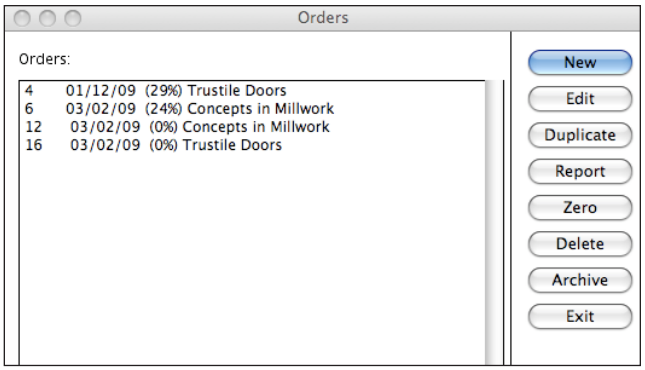


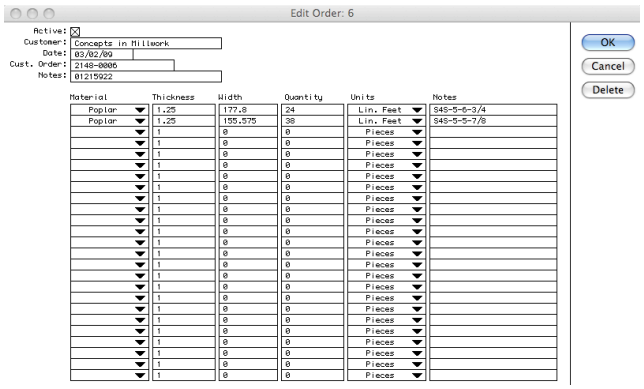
To create a new setup or switch to a different setup, click the "Setup List" button on either the main screen or from within the "Edit Setup" screen. A list of available setups will be displayed. To create a new setup, click on one of the setups in the list, then click the "Duplicate" button to duplicate it. To select an existing setup, click on the setup, then click the "Open" button.

Orders

Your Cameron Rip Software contains a powerful feature for custom moulding and millwork shops that will help you get the most from your machine and from your lumber. When your customers place an order, you enter this order into the Opti-Rip Software through the "Orders" menu. By entering your upcoming orders, you are

allowing the software to assist you in managing the work to be done.





Edit Orders

When you get an order, select "Edit Orders" from the "Orders" menu. Click the "New" button to create a new customer order. At this point, the software will assign an arbitrary order number shown at the top of the window. Enter the customer name in the "Customer" field. Use the "Notes" and "Cust. Order" fields to enter your job number or purchase order number. Select the "Material" pop-up field to select the appropriate species. If you do not see the proper species and grade listed among the choices, select "Other" to create a new species and/or grade entry. Enter the "Thickness" of the lumber to be ripped (inches), the "Width" of the part to be produced (inches), and the "Quantity" of that rip width. Note that you can specify the appropriate "Units" to properly describe the quantity. Any one order may have material specified in different units (Pieces, Lineal Ft, Bd Ft, or Sq Ft). Use the "Notes" field to designate part numbers or any other misc. information.

Once you finish entering the order data, select to "Active" check box to allow the Opti-Rip software to begin production on the order. If you have a particular order that you repeat frequently, enter it at any time and leave the "Active" check box unselected until you are ready to begin production on that order. Orders will stay in the system until they are deleted or "Archived".

Archive All Completed Orders

At the end of the day, the operator can review the orders and archive those completed. Archiving an order creates a production log for that order and deletes the order from the system. To simultaneously archive all of the completed orders, use "Archive All Completed Orders" from the "Orders" menu.

Archived Orders Report

The "Archived Orders Report" allows the operator to view the log of completed production data. The operator may select the appropriate date range to display.

Export Archived Orders

Periodically, the operator or manager may want to use the accumulated production data for analysis or to produce a custom report using data management software. Selecting "Export Archived Orders" from the "Orders" menu prompts the user to specify a location for saving and creates this file in .csv format.

Edit System Parameters

By selecting "Edit System Parameters" in the "Special" menu, the edit system parameters window is displayed. In this window, various values can be altered that affect the operation of the machine. Keep in mind that misadjustment of these values can render the machine unusable, so great care should be taken when editing them. The values that can be changed are as follows:

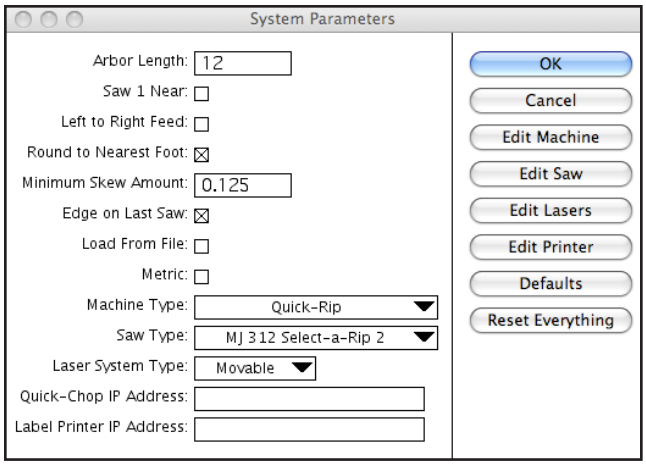
Arbor Length - The usable length of the saw arbor where the saws are installed. This value is only used for fixed arbor saws.

Saw 1 Near - This should be checked if the saw furthest in on the arbor is nearest the infeed end of the Opti-Rip, unchecked if it is furthest away. For most rip saws, this value should be set to checked for Opti-Rips that feed from left to right (from the operators point of view) and unchecked for Opti-Rips that feed from right to left.

Left to Right Feed - This should be checked for Opti-Rips that feed from left to right.

Round to Nearest Foot - When this value is checked, the computer will automatically round all board length measurements down to the nearest foot. A 10' 8" board will be tallied as a 10' board. When rounding, the laser sensors are used to measure the length of the board, giving a very accurate measurement. If this is turned off, the encoder on the pinch rollers is used to measure the length, hence the lower rollers will not drop until the entire board is fed into the saw, slowing the operation.

Min. Skew Amount - This value determines the minimum amount (in inches) a board will be skewed. Skewing will be ignored on boards that need to be skewed less than this amount.



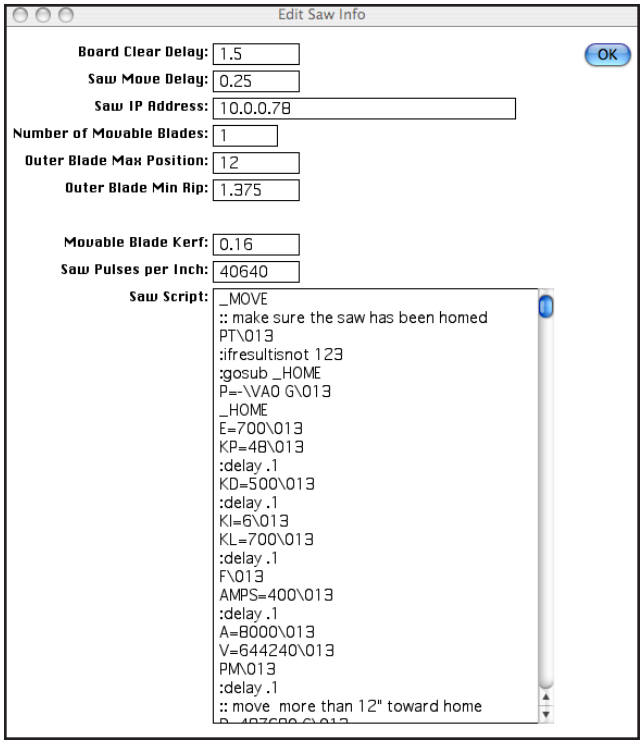
Edge on Last Saw - When this is checked, the machine will use the outermost saw when edging boards. If it is not checked, the innermost saw will be used.

Load from File - When this is checked, the "Setup List" button on the main screen will be changed to "Load". It's function will also change to allow the operator to load setup files that were created off line.

Metric - When this is checked, the machine operates using the metric system.

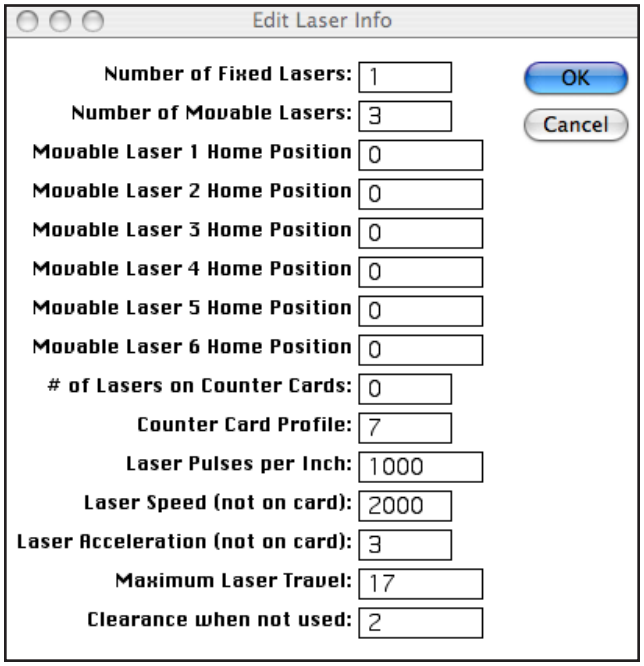
Machine Type - This should be set to the type of machine (Opti-Rip, Quick-Rip, Skew) that the software is operating. It will change the software slightly to match the machine. Clicking on the "Edit Machine" button will bring up additional system parameters specific to that machine (see below).

Saw Type - This should be set to match the type of saw that the Opti-Rip is feeding. For moving blade saws, the "Edit Saw" button will bring up another window with additional system parameters pertaining to the particular saw that is selected. The Board Clear delay is the time (in seconds) the machine waits from when the board present curtain sensor stops seeing a board until when it is safe to start moving the saw blade. This number should be set when the saw feed is running at the slowest value that is likely to be used. The saw move delay is the



time (in seconds) between when the move command is given to the saw and when the pinch roll motor starts to run to feed a board. The Saw IP address used to communicate with the saw. The Outer Blade Max Position should be set to the rip width that is between the first blade and the outer blade when the outer blade is in it's home position. This value should be adjusted to calibrate the width of the outer rips. The Outer Blade Min Rip should be set to the minimum rip width that can be obtained between the outer movable blade and it's neighbor before physical interference occurs. The Movable Blade Kerf should be set to the kerf of the outer blade. This is used when edging boards on the outer blade. The Saw Pulses per Inch determines how far the saw moves when commands are given. The Saw Script contains scripts for homing and move commands.

Laser System Type - This should be set to match the laser system on the machine. If it is set to movable lasers, The "Edit Lasers" button will bring up another window with additional system parameters pertaining to the lasers. The number of fixed and movable lasers in this window should match what is on the machine. The home positions are offsets (in inches) from the position of the first laser. These offsets don't need to be adjusted here since they are adjusted automatically when doing a laser setup. Up to two movable lasers may be controlled by counter cards in the main PLC. The remaining movable lasers are controlled by separate PLCs. The counter card profile determines how fast the lasers that are controlled by the counter cards move (1 through 7). If this is set too high, lasers may lose their positions. Laser acceleration sets the acceleration rates for the remaining



movable lasers. Again, if this is set too high, lasers may lose their positions. Maximum laser travel is the furthest (in inches) the laser can move from it's home position. Clearance when not used is the distance (in inches) the lasers will be positioned from the edge of a board when they are not used to display the current rip solution.

Quick-Chop IP Address - This is the IP address of a master Quick-Chop that is on the network with the Opti-Rip. When this IP address is not blank, the Opti-Rip can be set to rip based on quantities required by the Quick-Chop.

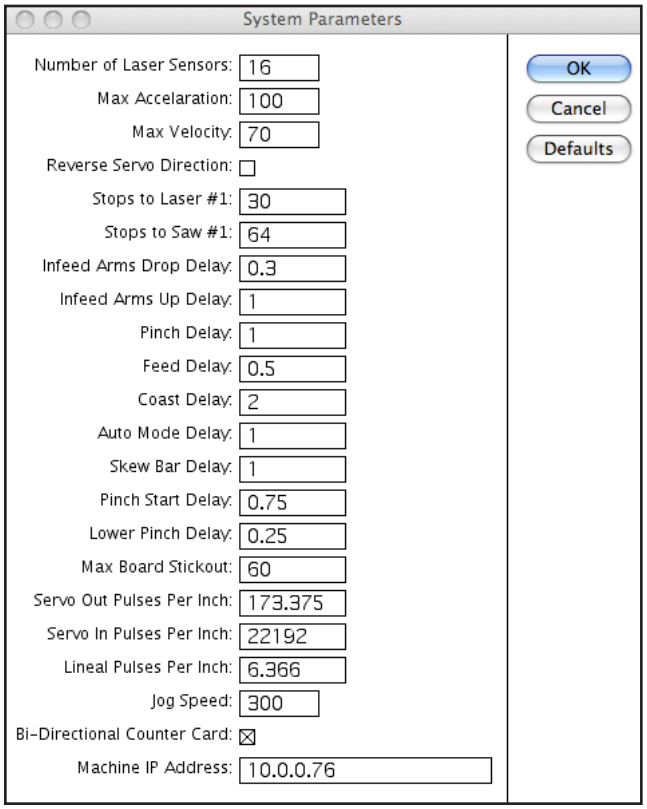
Label Printer IP Address - This is the IP address of a label printer that is on the network with the Opti-Rip. The label printer can be used to produced bundle labels for labeling bundles of finished rips.

Machine Specific System Parameters

The "Edit Machine" button brings up additional system parameters specific to the type of machine the software is controlling. The following parameters pertain to the Opti-Rip and Quick-Rip machines.

Number of Laser Sensors - This should correspond to the number of board measuring laser sensors that are on the machine (usually 12 or 16).

Max Acceleration - The maximum acceleration rate for the belt conveyor. If this value is set too high, the belts may slip underneath the board, resulting in positioning errors. The default value is 100.



Max Velocity - The maximum velocity the belts can travel when positioning a board. The default value is 70.

Stop to Laser 1 - This should be set to the distance from the stops (socket head screws) to the laser line representing the saw furthest in on the saw arbor. Increasing this value will cause the belts to move the board farther when positioning the board under the lasers. After adjusting this value, be sure to reposition the lasers using the Laser Setup item from the main menu.

Stops to Saw 1 - This should be set to the distance from the 2nd stops (socket head screws) to the saw furthest in on the saw arbor. Increasing this value will cause the belts to move the board farther when positioning the board in front of the saw. This value should be fine tuned so that the boards are actually cut where the lasers say they will be cut.

Chain (or Infeed Arm) Drop Delay - This value determines how long the machine waits from the time the chains drop to place a board on the belts to the time the belts begin to move. In general, this value should be set to .3.

Chain (or Infeed Arm) Up Delay - This value determines how long the chains stay down after placing a board on the belts before they come up again. In general, this value should be set to 1.

First Stops Delay (for Automated Opti-Rip Only) - This value determines how long the first stops (that separate one board from the inventory of boards) stay down when separating boards. If this value is set too high, multiple boards may be released before the stops return to their up positions. This value should be used in conjunction with the flow control valve located on the valve in the control box that operates the stops. In general, this value should be set to .3.

Pinch Delay - This value determines how long the machine delays from the time when the pinch rollers are first activated to the time when the belts begin to move again. If this value is set too low, the belts will start to move before the board is lifted completely off the belts, causing the board to be dragged out of position by the belts. In general, this value should be set to .5.

Feed Delay - This value determines how long the pinch roller feed motor runs to feed the board into the saw. This value should be set just high enough so that the board feeds far enough into the saw so that the saw feed system picks it up and continues to feed it. If this value is set too high, the roller feed motor will keep feeding even after the board enters the saw, causing the two drive systems to fight each other, possibly burning out the feed motor.

Coast Delay - This value determines how long the pinch rollers stay pinched on the board after the feed motor stops driving it. This delay should be set so that the upper pinch roller releases just before the board enters the saw blade. If this delay is too short, the board may not be held firmly in the saw feeding system when the pinch roller release. It it is too long, the pinch rollers will release after the board has entered the saw, possibly causing the board to jump slightly.

Auto Mode Delay - This value determines how the machine operates when the Auto switch is turned switched on and the machine is in run mode. This delay determines how long the computer will allow the operator to make adjustments using the jog knob and operator buttons before it automatically processes the board. If this delay is set too low, the operator won't have enough time to make proper decisions. If it is set too high, the machine will operate slowly. In general, this value should be set to 1.

Skew Bar Delay - This value determines how long (in seconds) the skew bar is given to lift the board before the belt is moved. This should be set in conjunction with the flow control valves on the skewing cylinder.

Pinch Start Delay - After the board to be fed is in position, this value determines amount of time (in seconds) from when the pinch rollers actuate until the feed belts are once again free to move for positioning the next board in front of the operator.

Lower Pinch Delay - During over/under feeding, this delay (in seconds) defines how long the machine should allow for the lower rollers to drop before the next board will be delivered under the board going into the saw.

Max Board Stickout - This is the maximum distance (in inches) that a board can be sticking out of the saw and allow the lower pinch rollers to safely lower.

Servo Out Pulses Per Inch - This is a value used internally by the computer to properly scale the input from the servo drive when measuring boards. Changing this value will change how the board widths are measured. In general this value should NOT be changed and should remain at it's original value of 173.375.

Servo In Pulses Per Inch - This is a value used internally by the computer to properly scale the output to the servo drive when positioning boards. Changing this value will change how the belts move. In general this value should NOT be changed and should remain at it's original value of 22192.

Lineal Pulses Per Inch - This value is used to adjust the lineal measurement of boards as they feed into the saw.

Jog Speed - This value determines how sensitive the jog knob is. Setting this to a higher value will cause the board to move more when the jog knob is turned.

Bidirectional Counter Card - This should be checked on later model machines that have multiple laser sensors. Earlier machines should leave this unchecked or the machine will have trouble positioning the boards under the lasers.

Machine IP Address - This is the IP address of the machine being controlled. For most machines, this should be set to 10.0.0.76. If left blank, the computer will open a machine simulation window to run instead of connecting to an actual machine.

Calibrating the Width Measuring Sensors

In order for the twelve or sixteen width sensors to measure a board accurately, the sensors need to be calibrated. It is not important for the sensors to be perfectly in line with each other. To perform the calibration, place a perfectly straight, parallel ripped 12' or 16' long board on the stops and hit the Process Button, so that the machine drops the board onto the belt and measures it. After the board has been measured, under the "Special" menu, select "Calibrate Sensors". When prompted for a password enter 1234. Next, enter the exact width of the board that was just measured and click on the "Calibrate" button. The computer will use the values obtained from scanning the board as well as the entered width to calibrate the sensors.

Simulate Production Run

When editing a setup, the "Simulate" button causes the machine to simulate a production run. This is useful for determining the value of a particular arbor setup without actually running lumber through the rip saw.

Production runs can be simulated either by using random board widths generated by the computer itself, or by using historical data. Every time a board is measured, it's width and length are stored in the setup.

When you simulate a production run, Opti-Rip asks you which type of data you would like to use, random, or measured. If you choose random, Opti-Rip asks for the minimum and maximum widths to use. It will then generate random values between these two numbers to use as board widths in the simulation. It also asks for a board length to use in the simulation as well as how many boards to simulate. If you choose to simulate using measured boards, the computer asks which setup it should get the historical widths and lengths from.

By comparing values, yields and piece counts from the reports generated using various arbor setups, an intelligent choice of arbor setups can then be made.

Production Analysis and Reports

The ability of Opti-Rip to update and retain board data is invaluable for both ongoing and post production analysis. The operation screen displays information which is relevant to the decision making process during the production run. Below is a summary of the terms presented on the main computer screen:

Width: The measured width of the board currently being optimized.

Yield: The yield in percent of the current board being optimized calculated by dividing the sum of all rip widths in a given combination by the measured width.

Auto-Deduct: The value assigned to the auto-deduct function in the current setup.

Value/M: The processed value of the board in $/MBF currently being optimized based on the values of the ripped stock it produced. It is the sum of all the produced rip widths times their respective value divided by the actual measured width of the board.

Deduct: The value assigned to the deduct function in the current setup.

Process Time: The amount of accumulated time that has elapsed during a production run since starting the new batch. Any pause in board measurement exceeding five (5) minutes causes the clock to stop, return to the point of its last board measurement and wait for a new board to continue.

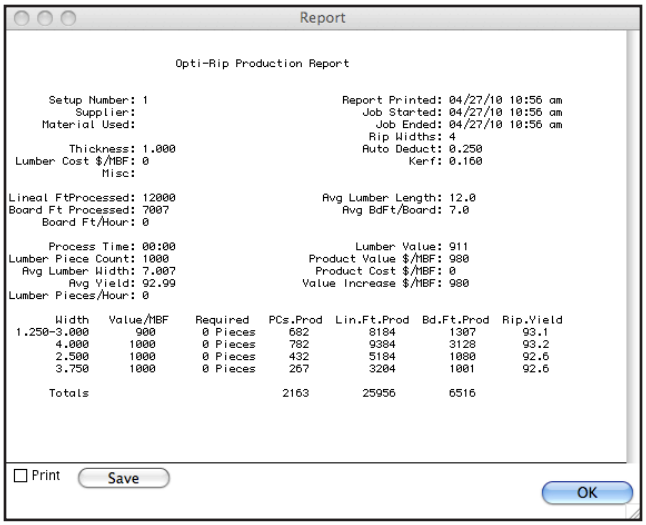
Average Yield: The running average yield of all the boards within a batch which were optimized.

Bd. Ft. The accumulated board feet volume of all the boards within a batch that were optimized. For systems with lineal measurement option only.

Average Value: The running average value of all the boards within a batch that were optimized.

Most of these statistics are included in the Post Production Report which also lists the background information specific to this set-up number and production run. The report contains statistics on both the pre-processed lumber and the ripped widths it produces. It also identifies the financial out come of the production run by calculating the various costs and values necessary to make objective comparisons. The following defines the terms

used in this financial analysis portion of the report.



Lumber Value $/MBF: The running average value of all the boards within the batch that was optimized. It is based on the product values of the processed boards times the average yield of the lumber.

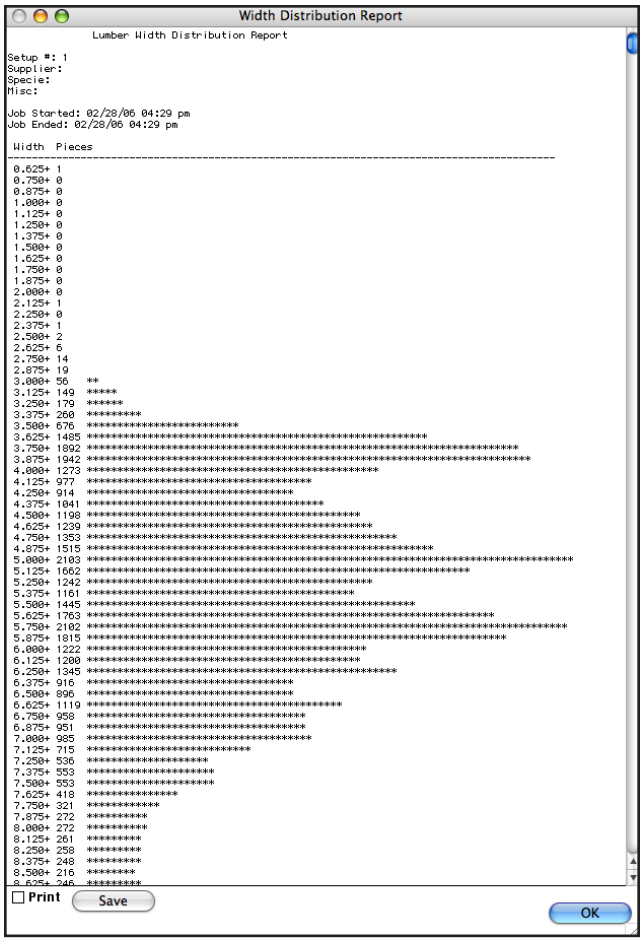
Product Value $/MBF: The average processed value of the ripped stock based on the weighted values of each rip width of all the combinations chosen during production.

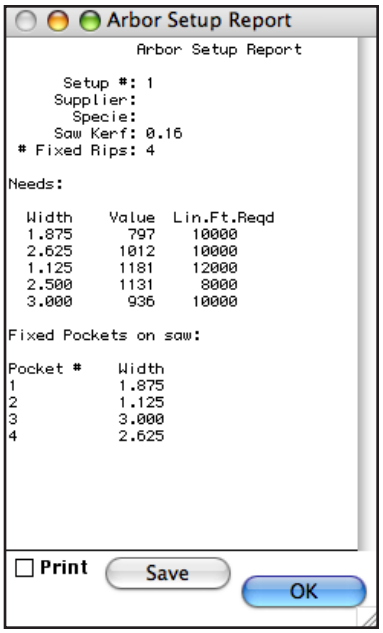
Product Cost: The net cost of the lumber after adjusting for its yield to produce the ripped stock.

Value Increase: The difference between the product value and product cost which represents the gross profit (or loss) of this production run. This gain (or loss) does not include any overhead or processing costs. Therefore, these expenses must be subtracted from this figure to get an accurate representation of the financial results of this production run.

The Opti-Rip Production Report is invaluable for maintaining inventory control, comparing the utilization of lumber from different supplies, examining plant efficiency and keeping product pricing consistent with the changing costs of production.

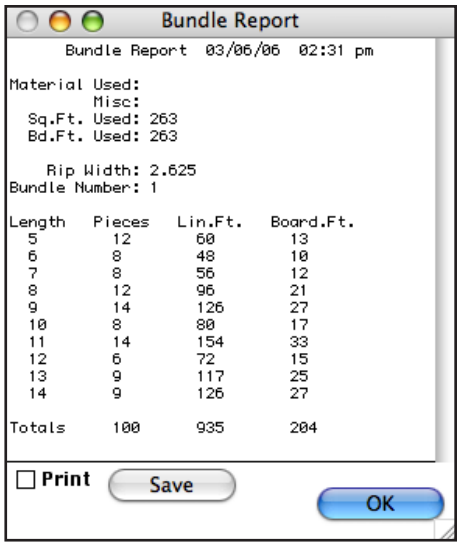
As the report summarizes the frequency (quantity) of the rip widths produced, it can be used to lend insight on more effective saw arbor configurations for the various suppliers of lumber.


Width Distribution Report
Lumber Width Distribution Report
Setup #: 1
Supplier:
Specie:
Misc:
Job Started: 02/28/06 04:29 pm
Job Ended: 02/28/06 04:29 pm
Width Pieces
0.625+ 1
0.750+ 0
0.875+ 0
1.000+ 0
1.125+ 0
1.250+ 0
1.375+ 0
1.500+ 0
1.625+ 0
1.750+ 0
1.875+ 0
2.000+ 0
2.125+ 1
2.250+ 0
2.375+ 1
2.500+ 2
2.625+ 6
2.750+ 14
2.875+ 19
3.000+ 56 **
3.125+ 149 *****
3.250+ 179 ******
3.375+ 260 *********
3.500+ 676 **********
3.625+ 1485 **********
3.750+ 1892 **********
3.875+ 1942 **********
4.000+ 1273 **********
4.125+ 977 **********
4.250+ 914 **********
4.375+ 1041 **********
4.500+ 1198 **********
4.625+ 1239 **********
4.750+ 1353 **********
4.875+ 1515 **********
5.000+ 2103 **********
5.125+ 1662 **********
5.250+ 1242 **********
5.375+ 1161 **********
5.500+ 1445 **********
5.625+ 1763 **********
5.750+ 2102 **********
5.875+ 1815 **********
6.000+ 1222 **********
6.125+ 1200 **********
6.250+ 1345 **********
6.375+ 916 **********
6.500+ 896 **********
6.625+ 1119 **********
6.750+ 958 **********
6.875+ 951 **********
7.000+ 985 **********
7.125+ 715 **********
7.250+ 536 **********
7.375+ 553 **********
7.500+ 553 **********
7.625+ 418 **********
7.750+ 321 **********
7.875+ 272 **********
8.000+ 272 **********
8.125+ 261 **********
8.250+ 258 **********
8.375+ 248 **********
8.500+ 216 **********
Print
Save
OK


Arbor Setup Report
Arbor Setup Report
Setup #: 1
Supplier:
Specie:
Saw Kerf: 0.16
Fixed Rips: 4
Needs:
Width Value Lin.Ft.Reqd
1.875 797 10000
2.625 1012 10000
1.125 1181 12000
2.500 1131 8000
3.000 936 10000
Fixed Pockets on saw:
Pocket # Width
1 1.875
2 1.125
3 3.000
4 2.625
Print
Save
OK

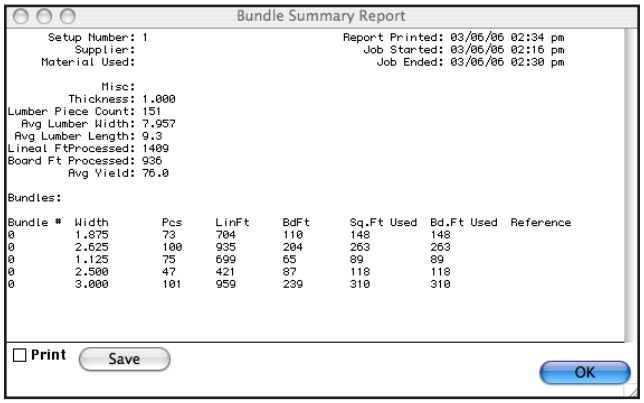
Width Distribution Report

When a production run is complete (or anytime during a production run) the Width Distribution report will graphically show the distribution of the average widths of the incoming lumber. This information can be useful when designing another arbor to be run with similar lumber. This report can also be a valuable tool for verifying that purchased lumber hasn't been pre-sorted and picked through for particular widths.



Arbor Setup Report

The arbor setup report shows the information necessary to set up the Opti-Rip software and the rip saw for a particular job. If the software is used off-line to optimize jobs, this report can be printed and given to the rip saw operator so that he knows how to set the job up. On movable blade saws, the top portion of the report shows the rip needs while the bottom portion shows how the saw should be set up.



Bundle Report

In most operations, as pieces exit the ripsaw, they are sorted by width and placed in wagons. A bundle report creates a printout to go on each wagon when the wagon is filled or when the job is complete. At any time during the job, when a wagon is full, the operator can print a bundle report. The software will ask whether to start a new bundle from that point in time. The bundle report shows how many of each length is in the bundle as well as how much material was used to make it.

Bundle Label

An ethernet label printer can be optionally used to produce the bundle reports. These labels are user customizable by editing the format in "Edit Bundle Label Format".

Bundle Summary Report

The bundle summary report shows a log of all of the bundles that were produced on the current job along with material used. This report can be used to adjust inventory values after a job has been run. This report can be exported to a tab delimited file that can be read into a spreadsheet by choosing "Export Bundle Summary" under the "File" menu.

Pack Report

The "Pack Report" shows statistical information regarding the incoming lumber from your supplier. When you generate this report, you are prompted to begin a new pack. Pressing cancel will allow you to see the current status of the report without clearing it.

Part Names

Part names can be used to identify both rough material and rips produced. When part names are used, the bundle reports and summaries will also show these part names. The first step in using part names is to choose "Edit Parts File" under the "File" menu. Use the text editor to create three columns, the first being the part name, the second being the piece width (or zero if unknown), and the third being a description. Columns should be separated by one or more spaces. Once this file is created, part names can then be used when editing a setup in the Material Used field and in the Reference fields for the individual rips. When these part names are entered, their widths will automatically be pulled from the parts file.

Memory Stick

Your Opti-Rip includes a memory stick. The Opti-Rip software uses this memory stick (which must be named "Backup") to create an archive of your machine parameters, setups, board data, etc. in case of system failure.

For protection, back up your system regularly. This is done by selecting "Backup to Memory Stick" from the "Special" menu. The process can take a couple of minutes to complete. Wait for the window that tells you that the files have been backed up.

The memory stick can also be used to transfer setups and board data from the machine to an office computer or vice-versa.

Viewing Data Remotely

Your Opti-Rip software includes the ability to view certain production data from a web browser. If Opti-Rip computer has been properly networked, you can access a general report for the current setup by using the syntax:

http://10.0.0.75:21000/?report

A general report can be accessed for a specific setup number as well. For example, to access setup #5, use:

http://10.0.0.75:21000/?report=5

You can also see the width distribution of the incoming lumber from various setups. To view the current setup being used:

http://10.0.0.75:21000/?widthdist

For a width distribution for the lumber processed on setup #5:

http://10.0.0.75:21000/?widthdist=5

Note that the ip address shown in this example is the default ip address as assigned at our factory. This may vary for compatibility with your local network. See your network administrator for more information.

Arbor Optimization

One of the most important factors in maximizing yield (or value) when running a gang rip saw is properly configuring the saw spacing on the arbor. Given that there can be as many as 39 million ways to arrange a particular arbor, this can be a daunting task for a human. A computer, however, can quickly evaluate and optimize these arbors. Built into the Opti-Rip software is a powerful arbor optimization program that can result in dramatic yield increases when used properly.

This arbor optimizer can be run either on the Opti-Rip itself or on a desktop computer using the simulation software provided. It is often best to take some time running the software on a desktop machine in order to educate yourself about arbor optimization.

In order for the computer to optimize the arbor, it must be given some pieces of information:

Desired Rip Widths
Rip Values or Required Quantities
Saw Kerf
Arbor Length
Lumber Size Range
Maximum Number of Saws

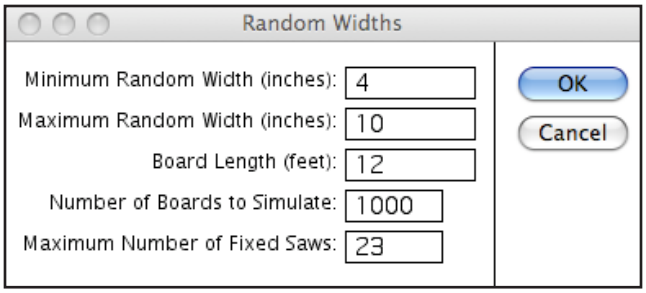
Given the above information, the Opti-Rip arbor optimizer operates in two basic modes as determined the setting of the “Rip For Req’d” field. In the first mode (when Rip For Req’d is unchecked), the Opti-Rip optimizes an arbor for yield or value given the desired rip widths. When the values are all set to the same number, yield is maximized.

In the second mode (when Rip For Req’d is checked), the optimizer configures an arbor that will produce approximately the required number (or lineal feet) of each rip, while at the same time maximizing the yield. When in this second mode, rip values are ignored and are automatically adjusted by Opti-Rip as the batch of lumber is processed.

Keep in mind that as you put more constraints on the process, you will usually decrease the overall yield. If you set values to something other than all equal values or if you rip for required amounts, you will likely get slightly lower yields than if you rip strictly for yield (all values equal and Rip For Req’d unchecked).

To optimize an arbor, first edit a setup as described earlier in this manual. If you only want four different rip widths on the arbor, set the number of rip widths to four so that you have to enter the minimum amount of information. Be sure to enter the saw kerf. Next, fill in the rip widths and their values. When ripping strictly for yield, you can enter 1000 for all values.

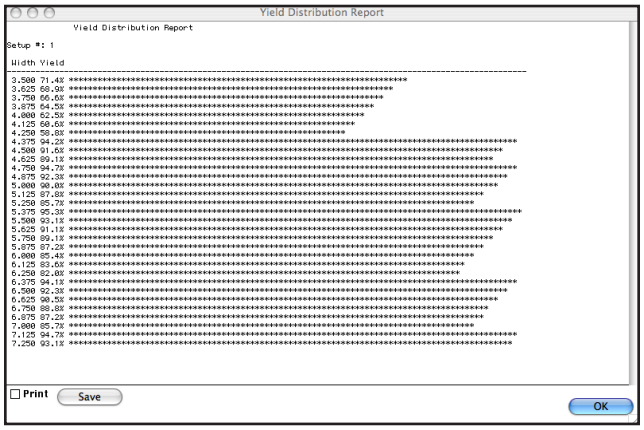
Click on the "Optimize" button in the setup window. The optimizer will ask for some additional optimization information. Enter the minimum and maximum width of boards to optimize with. Choose minimums and maximums that will cover 90% of the boards in your pack. Enter the number of boards to simulate. When ripping for required quantities, zero can be entered here. Enter the maximum number of fixed blades the optimizer can include in a solution. If you only have four fixed blades, you don't want a solution that includes five fixed blades. Click the OK button and the software will optimize the arbor and then simulate a production run and produce a production report. When looking at the report, look specifically at the yield and the quantities of each rip produced.



When using a saw with movable blades, you will need to click on the "Edit Saw" button to see how the software arranged the fixed blades on the arbor.

Yield Distribution Report

When editing a setup, clicking on the "Yield Dist." button will produce a yield distribution report. The software will prompt for a minimum width, a maximum width and an increment. It will then produce a graphical report that shows what yield can be expected from each width of lumber, from the minimum to the maximum, using the current arbor configuration. This report is very useful in showing where a particular arbor arrangement is weak and where it is strong.



Getting the Most with your Lumber with Opti-Rip

Opti-Rip offers the option of optimizing lumber for either board yield or board value. When the values of the different rip widths in a saw stack are the same, Opti-Rip calculates the rip solution exclusively for maximum dimensional yield and the minimum amount of waste. This mode of operation is appropriate when the ripped stock is going into a common product such as glued panels or when there is no differential in the value of the stock used to produce the finished product. Opti-Rip can also optimize lumber for the most valuable (or profitable) rip solution. In this mode the different values are assigned to their respective rip widths and Opti-Rip will compute the combination of rips which will result in the highest dollar return and not the highest yield. This mode of operation is appropriate when the ripped stock is going into different products, having different values, such as moldings, where the wider widths command a higher price.

Just as Opti-Rip will emphasize the most valuable ripping, it will de-emphasize the least valuable. When the quantity of a rip width is achieved during a production run and it's not appropriate to change the saw stack at that time, the value of that satisfied rip width can be reduced to reduce the frequency that rip will be included in the calculated rip solution.

It is important that the routine used by the operator while gang ripping lumber takes full advantage of the flexibility and features offered by Opti-Rip. By combining the computer's ripping solutions and laser line guidance with the operators' insight of the quality requirements and defect limitations of the ripped stock being produced, the primary goal to recover the maximum amount of clear ripped stock with minimum waste can be achieved. Opti-Rip's multiple laser line display of the complete rip pattern of the calculated solution provides the operator with the ability to see where each cut will be made in relation to the edges and defects present in the board being ripped. The operator can then position the board to best isolate the defects in the minimum amount of rips and avoid splitting a defect so as to require the subsequent cross cutting of two ripped pieces.

Once the board is measured, the first rip solution is projected for operator examination. There are two reasons why the originally calculated rip solution might be unacceptable:

1) The first concerns the relationship between the rip solution and the dimensional characteristics of the board. For instance, should either or both of the laser lines indicating the outer most saw cuts miss the edge of a board due to side bend or board taper, or if excessive wane would impair the quality of the outside rips, then the next rip solution should be calculated based on the next narrower combination of saws. For this condition the use of the "Deduct" operator input switch is most desirable as it will calculate the next narrower rip solution by subtracting the value assigned to the "Deduct Function" from the proposed rip solution to determine the next most efficient combination.

2) The second reason that would make a rip solution unacceptable concerns the quality of the board being ripped, specifically the relationship between the position of defects and the quality requirements of the various rip widths being produced. If after positioning a board under the laser lines, defect locations on the board surface make this choice undesirable, the board should be first flipped over to determine if inverting the pattern on the board makes this original and optimum rip solution acceptable for immediate feeding. Should this pattern remain undesirable the use of the "Next Pattern" operator input switch is desirable as the next most valuable solution is then calculated and presented on the board.

This next best solution is based on the combination of saws which results in the next highest product value of the combined rips. These alternatives calculated by the "Next Pattern" switch are presented in order of descending value and NOT in order of descending dimensional yield. It is very possible that this next solution is actually wider than the previous solution and of a higher board yield while the value has declined.

If the proposed combination is still unacceptable, the board should be again flipped over to examine the rip pattern on the reverse side of the board before going to the third best rip solution. By comparing the proposed rip solutions to both sides of the board, you are greatly increasing the opportunity to use the highest valued saw combinations.

It is also suggested that the operator concentrate his (or her) attention on the laser line projection of the rip pattern rather than the computer display. The operation screen was designed to provide information regarding the status of the production run and not as a guidance system for the operator.

Algebraic Expressions of Opti-Rip Calculations

Variable Definitions :

(RW) = An individual rip width within a saw stack in inches
(V) = Rip width value in $/MBF
1 = First board of a series or the first rip width of a saw stack used as part of the rip solution of a board
N = Final rip width of a saw stack used as part of the rip solution of a board (max. possible is 11 limited by the 12 saws)
Z = Total number of boards processed
(BW) = Measured board width

1. Product Value

The product value of an individual board is expressed:

$$PV = [(RW_1)(V_1) + (RW_2)(V_2) + ... (RW_N)(V_N)] / (RW_1) + (RW_2) + ..RW_N]$$

The average 'PRODUCT VALUE' (PVA) which is printed on the report is the running average of all the processed boards. It is calculated:

$$PVA = [PV_1 + PV_2 + ...PV_Z] / Z$$

2. Value/M

Value/M displayed on the screen is the value of the board currently being processed. This single board value (BV) is calculated:

$$BV = [(RW_1)(V_1) + (RW_2)(V_2) + ... (RW_N)(V_N)] / BW$$

3. Average Lumber Value

The average lumber value (LVA) is displayed as 'AVER. VALUE' on the operation screen and printed as 'LUMBER VALUE'
on the report It is the running average of all board values for those boards processed and is calculated :

$$LVA = [(BV_1)+(BV_2) + ... BV_Z] / Z$$

4. Product Cost

Product cost (PC) is the actual net cost of the lumber after adjusting it for its yield to produce the ripped stock.

PC = Lumber Cost in($/MBF) / the average yield of all lumber processed.

Opti-Rip Computer Software

You can download the Opti-Rip Computer Software from our web site (user account required):

http://www.cameronautomation.com/

The Opti-Rip simulation is useful in understanding the operation of the Opti-Rip and creating the optimal arbor design. Once setups are created on the simulator, they can be transferred to the machine via a memory stick or over an ethernet network.

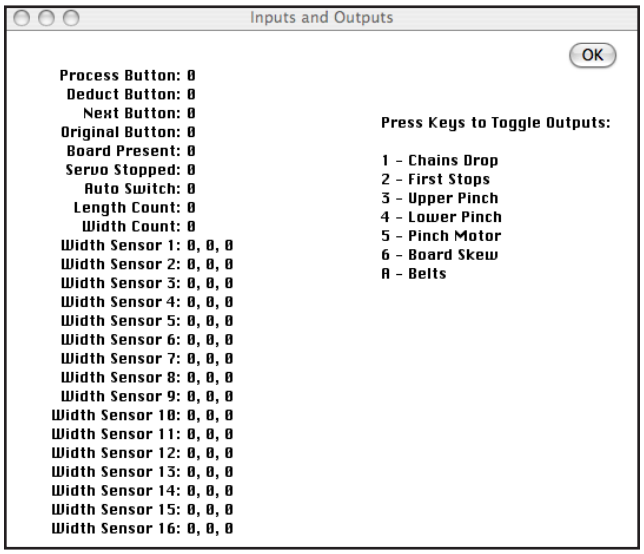
To simulate running the Opti-Rip, press the "Process" button in the Simulation window. The boards should be processed just as if you were running the actual machine.

TROUBLESHOOTING

Diagnostics - Inputs and Outputs

Selecting "Inputs and Outputs" from the "Diagnostics" menu opens the Inputs and Outputs window. This window can be used to test various inputs and outputs.

Inputs



The items displayed on the left hand side of the window are the values for the inputs. When the buttons are pressed, or the inputs are activated, these values should read 1, otherwise they should read 0.

The Length Count represents a counter value for the optical encoder located on the pinch roller. When the pinch roller is rotated in either direction, this counter should count up.

The Width Count counts when the belts are moved. This should count up when the belts move a board toward the saw and down when moving away from the saw.

The width sensors each show three values. The first value changes from 0 to 1 whenever the beam is broken. The remaining values are the servo counter values for the leading and trailing edge of the most recently measured board.

Outputs

Outputs can be energized by pressing keys on the keyboard. Pressing the key causes the corresponding output to be toggled on and off again. These are listed on the right hand side of the window.

In addition, the belts can be activated by pressing the A key. When the A key is pressed, the belts should move exactly 24 inches. When the A key is pressed a second time, the belts should move exactly 24 inches in the opposite direction.

Operational Troubleshooting

Nothing displays on the screen	Press the Power button on the computer. Check that the Power Adapter is working properly. Press and hold the ⌘ and Control keys while pressing the Power button
The Machine feeds one board, then stops	Make sure the Board Present light curtain that is positioned between the pinch rollers and the rip saw is operating properly. If the sender and receiver are out of alignment, the machine will "hang", waiting for the board to finish feeding into the saw.
Boards aren't measured properly	Go into the "Inputs and Outputs" window. Hold something between the measuring sensors while you press A on the keyboard. The belts should move and the Sensor Counts item on the screen should count up. If it counts up whenever the belt moves, regardless of whether the sensor beam is broken, then the sensor transmitter and receiver may not be aligned properly. There are LED's on the sensor itself that indicate when the sensors are aligned. If boards are still being mismeasured, try lowering the Accel value in the system parameters so that the board moves more slowly.

Boards don't feed straight into the saw

Watch the back end of the board as it feeds into the saw. If the back end of the board jumps to one side when the pinch rollers release, the saw is not lined up properly with the feed of the pinch rollers. Rotate the saw as described in the installation section of this manual.

Watch and make sure that the belts aren't moving until after the board is completely lifted off the belts by the pinch rollers. If the belts are moving too early, increase the Pinch Delay in the system parameters.

If the boards are feeding into the saw consistently cocked by the same amount, adjust the stops (socket head screws) by the appropriate amount to change the angle that the board is fed into the saw. The lasers will have to be realigned after this is done.

Make sure all of the upper and lower rollers are touching the surface of the board being fed.

Boards feed straight, but are consistently off to one side when ripped

Change the system parameter labeled Stops to Saw1. Increasing this value will cause the belts to move the board farther into the pinch rollers before being fed into the saw.

If the boards' positioning is still inconsistent, the boards may be slipping on the belts because the acceleration is set too high. Try lowering the Accel value in the system parameters.

Boards feed up to the saw, but never get picked up by the saw feed system	The Feed Delay in the system parameters is probably set too low. Increase this delay by small amounts until the saw consistently picks up the board. Setting this value too high will cause the two machines to fight each other and will result in premature wear.
Lineal Measurement doesn't work	Go into the diagnostics screen and make sure the Encoder Counts value increases when you trip the board present light curtain and spin the roller with the encoder on it. The encoder counts value will not count unless the curtain is tripped.
Lineal Measurement isn't accurate	In the system parameters, the Pulses Per Inch value must be calibrated properly. Increasing this value will cause the machine to measure boards shorter. This value may need to be different for different types of lumber, depending on how much the roller slips on the surface.

MJ SR2 Error Messages

"Can't connect to saw."	Unable to create a TCP/IP connection to the Digi-One. Check cable between Quick Rip and Rip Saw. Check Digi One Status (see Service Section for Digi One info)
"Can't move saw because saw press roll proximity switch is activated."	Check the adjustment of the switch on the Gang Rip Saw press roll.
"A servo is disabled. Performing automatic re-home."	Error will appear in the message box. Indicates that a moving saw blade servo has tripped out or has been shut off. Check the status of the Gang Rip saw servo drives.
"Error when commanding saw to move."	Communication with the moving saw blade servo drive has been established, but it is returning an error. Check the error code on the gang rip saw servo drive.
"Timed Out while waiting for drives to home."	We have been able to tell the drives to home, but homing is taking too long.
"No response from the saw servo drive."	We were able to talk to the Digi-One, but not the servo drives. Check serial cable between the Digi One and the gang rip saw communication module.

Light Curtain Alignment and Adjustment

If you are having issues with the light curtain on your Opti-Rip, follow the steps below:

1) Place the optic windows as much inline as possible. Alignment between the axes of the two elements must not exceed ±1.5°.
2) Power on the system. The green LED's will turn on, indicating that the power is correct. Turn the trimmer on the emitter (see below) all the way clockwise. The red LED on the emitter will have to be switched off, indicating the presence of the correct synchronism.
3) Correct the direction of the emitter by observing the red LED on the receiver and trying to find the position in which the LED completely switches off or shows a weak light. Then temporarily fix the emitter in this position.
4) Correct the direction of the receiver by observing its red LED until it is completely switched off or shows a weak light. Then temporarily fix the receiver in this position.
5) Repeat points 3 & 4 until when you reach alignment.

**It's important to take note of the following items:
-The RED LED on the receiver lights proportionally to the signal received and remains turned off when the signal is optimum.
-Do not allow dust, water or condensation to deposit on the optics.
-Avoid exposing optics to organic solvents. To clean, use a damp rag and dry thoroughly.
-Do not allow strong light or sunlight to fall directly onto the optics of the receiver.

MAINTENANCE

Daily Maintenance

(Photocopy for daily use)

Daily Maintenance Checklist	Comments	Date By	
• Keep interlocks clean and tested.			
• Keep the keyboard clean and clear of sawdust.			
• Keep sensor clean and clear of sawdust.			
• Backup to Memory Stick.			

Monthly Maintenance

(Photocopy for monthly use)

Monthly Maintenance Checklist	Comments	Date By	
• Keep the belts tightened just enough so the belts hang 1/8" below the bottom of the belt track. Overtightening may damage the belts.			
• Grease all bearings			
• Check all bearing set screws for tightness on shafts.			
• Check all cylinder clevises for wear.			
• Check all pivoting and moving parts for wear			

PARTS & SERVICE

34W-5

To program Digi-One:
Connect Digi-One to our network. It will pick up an internet address via DHCP. Use a web browser to connect to the Digi-One. Start with address 10.0.0.150. Keep incrementing by one until it asks for a password. Use Username "root" and password "dbps". Go to the Backup/Restore screen and Restore using the MJ32-SR2 file on the drawings disk under PLC projects. (This will set the IP Address to: 10.0.0.78)

Leave the dip switches at the factory default (RS-232)

Use a 9 pin serial extension cable to connect the Digi-One to the bottom of the B & B RS-232 to RS-485 converter which is located inside the MJ control box.

Cut the Digi-One power cable and connect the Digi-One end of the cable to the 24V DC power supply located inside the MJ control box. Connect the wire with the white stipe to positive on the power supply.

MJ312-SR2 Digi-One connection

Scale:	**James L. Taylor Mfg. Co.** Poughkeepsie, N.Y., U.S.A.	
Material:		
	11-30-06 BQ	34W-5

PARTS & SERVICE

Digi One SP LEDs

LED	Color	State	Indicates
Power	Red (labeled PWR)	On	Power detected
		Steady blinking	Waiting for an IP address
		Blinking 1-1-1	Starting the EOS
		Blinking 1-3-1	Starting the TFTP process
		Blinking 1-5-1	Configuration returned to factory defaults
		Blinking 9-1-1	Contact Tech Support +1 (952) 912-3444
		Off	No power detected
Link	Green	On	Physical network detected
		Off	No physical network detected
ACT	Yellow	On	Bad initialization
		Off	Ready
		Blinking	Network activity

Digi One SP Specifications

Attribute	Value
Main Power Connector	9-30 VDC barrel connector
Ambient Temperature	10 to 45°C
Relative humidity	5 to 90% non-condensing
Length	3.7 in. (9.4 cm)
Width	1.72 in. (4.3 cm)
Depth	0.93 in. (2.3 cm)

FCC Class A Statement: Digi One SP

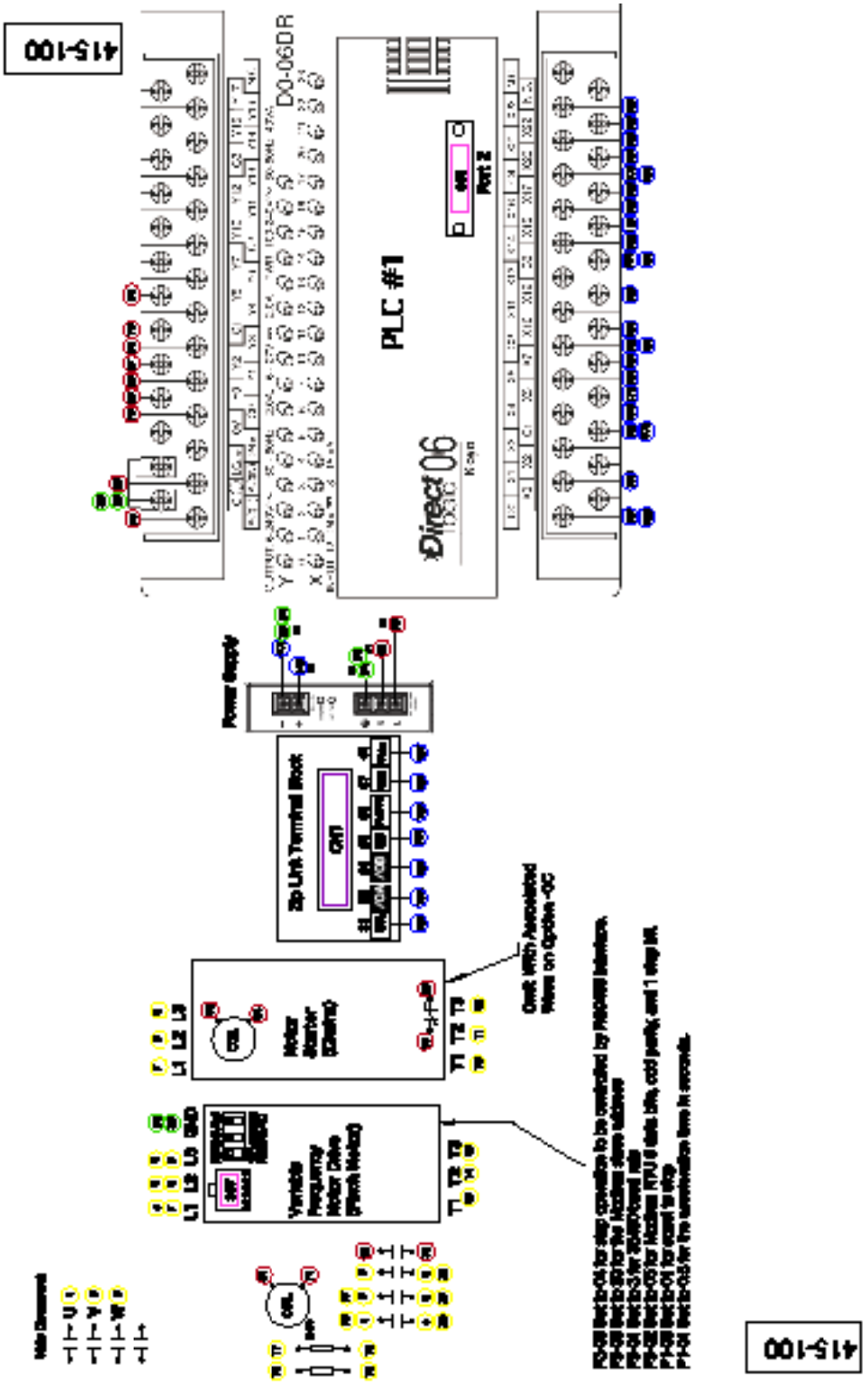
These devices comply with part 15 of the FCC rules. Operation is subject to the following two conditions: (1) These devices may not cause harmful interference, and (2) These devices must accept any interference received, including interference that may cause harmful operation.

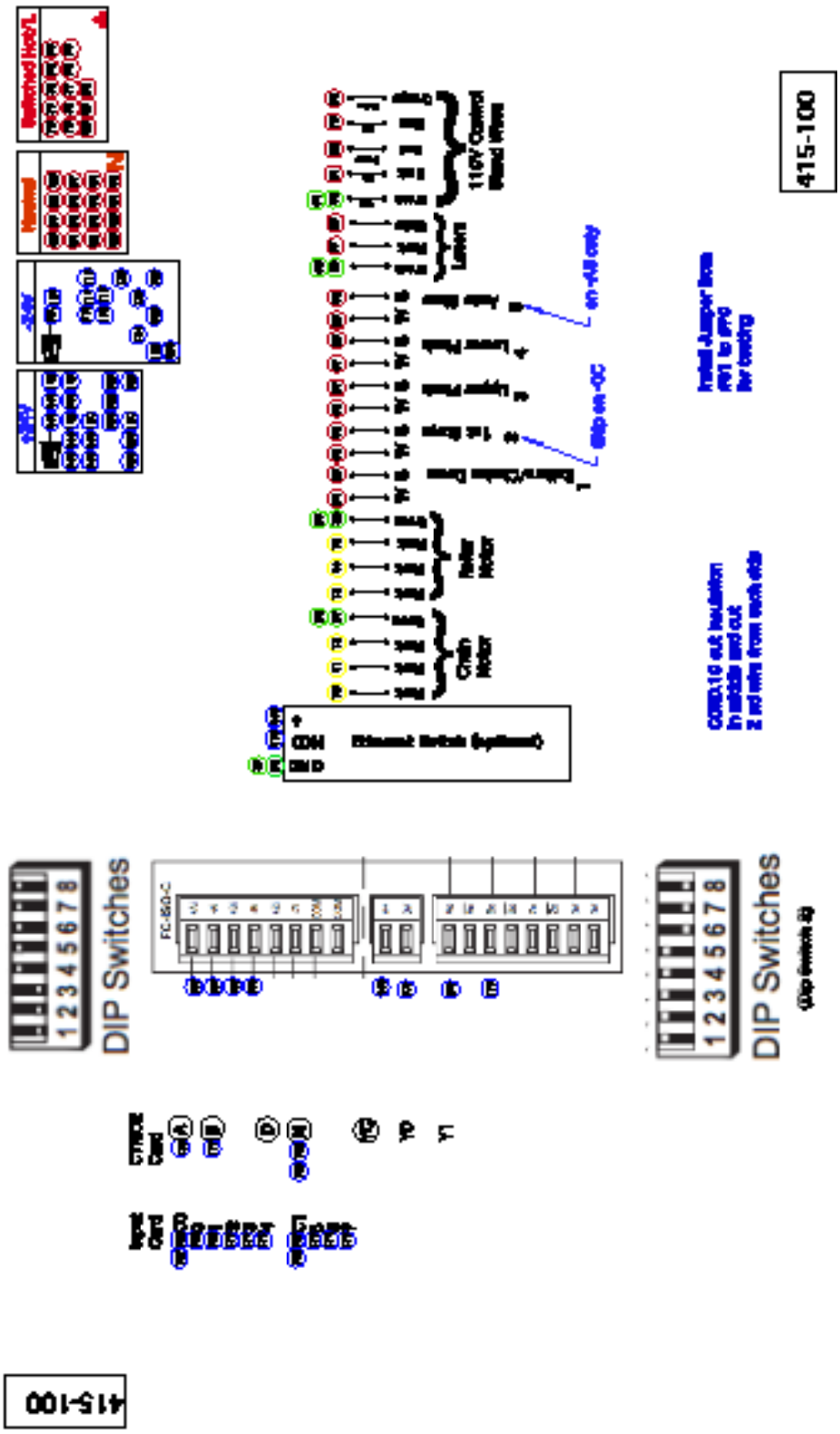
Digi One SP Emissions

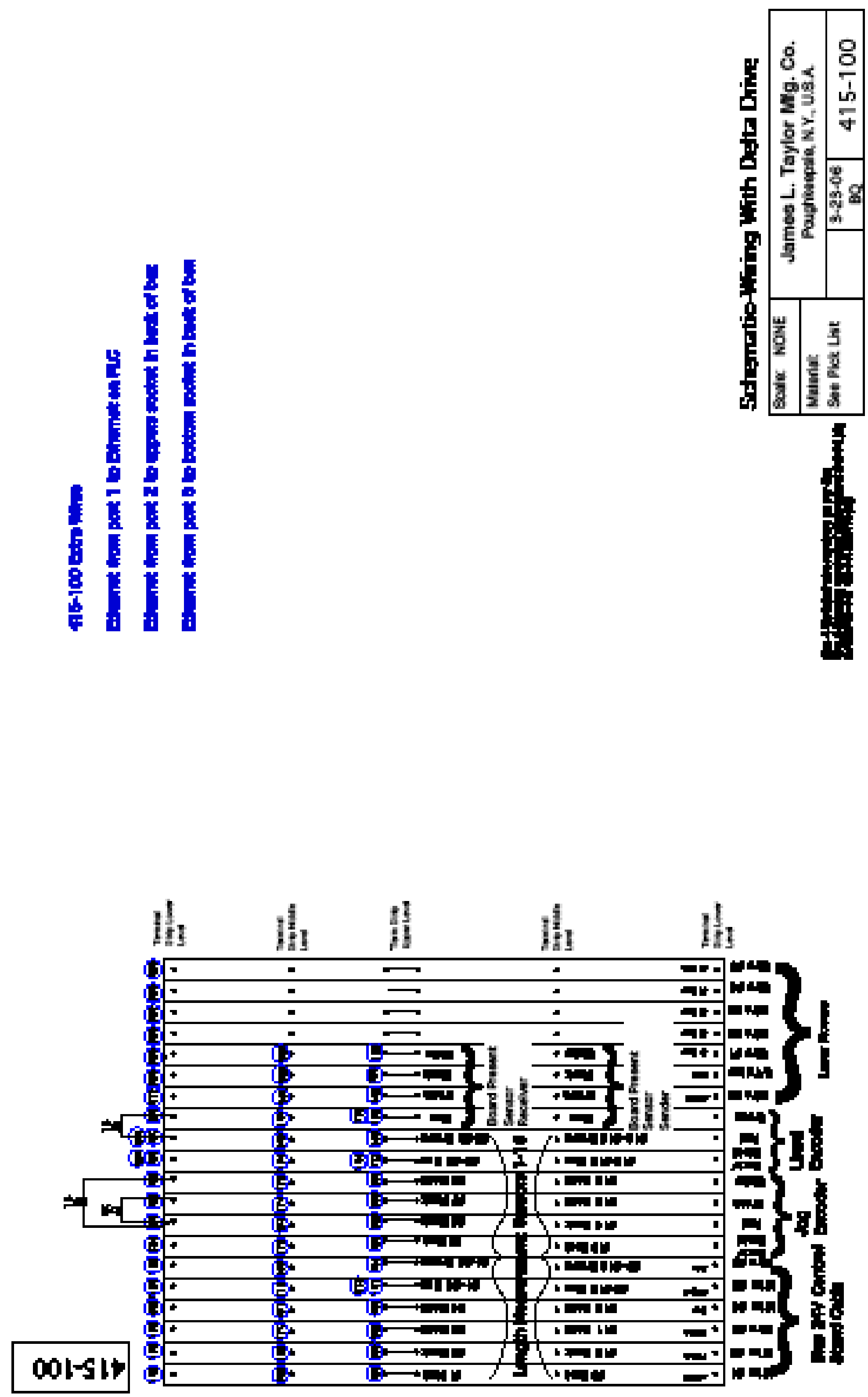
- FCC Part 15 Subpart B, Class A
- EN 55022, Class A: 1998
- ICES-003, Class A
- VCCI, V-3/99.05
- AS/NZS5 3548

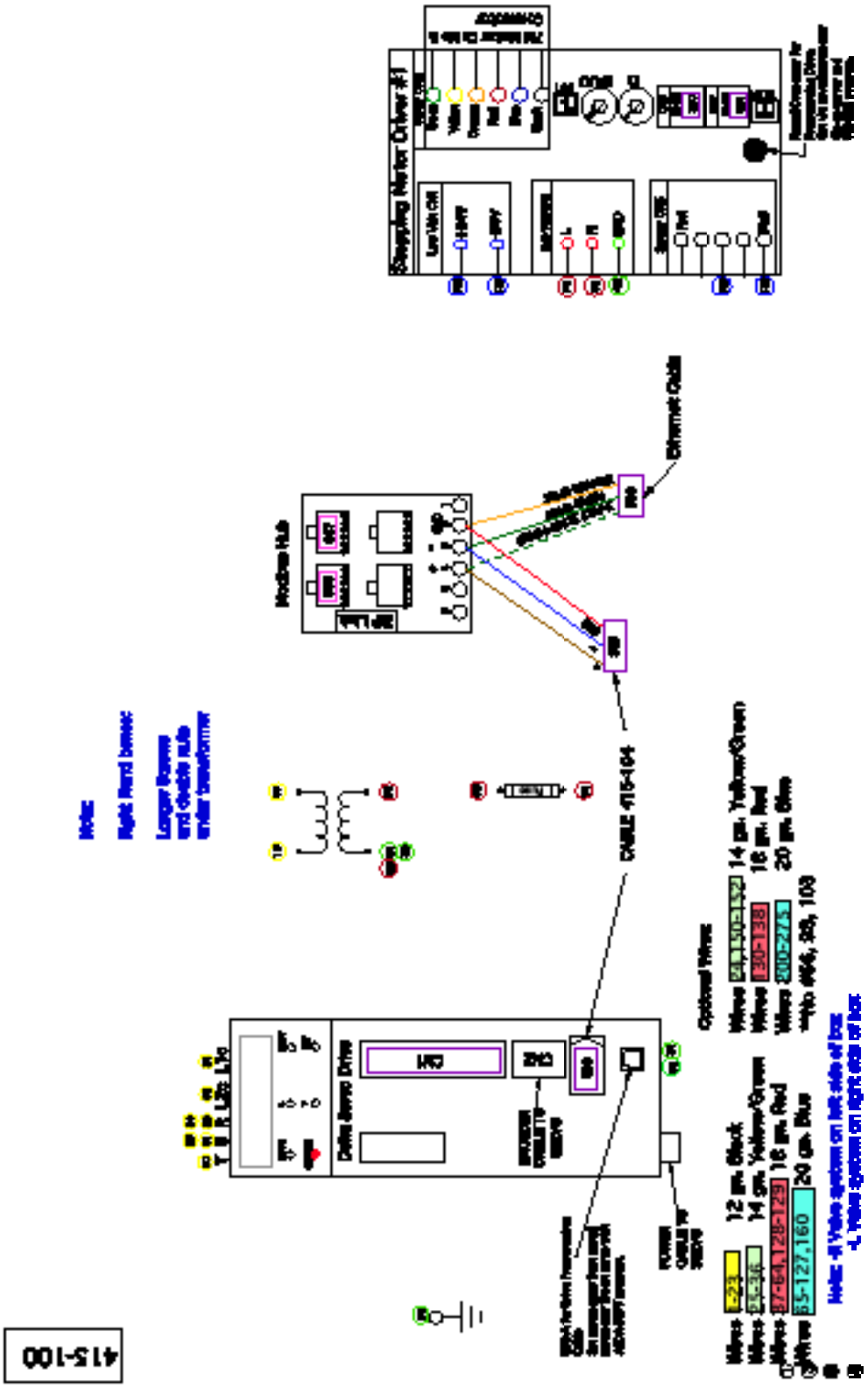
Digi One SP Immunity

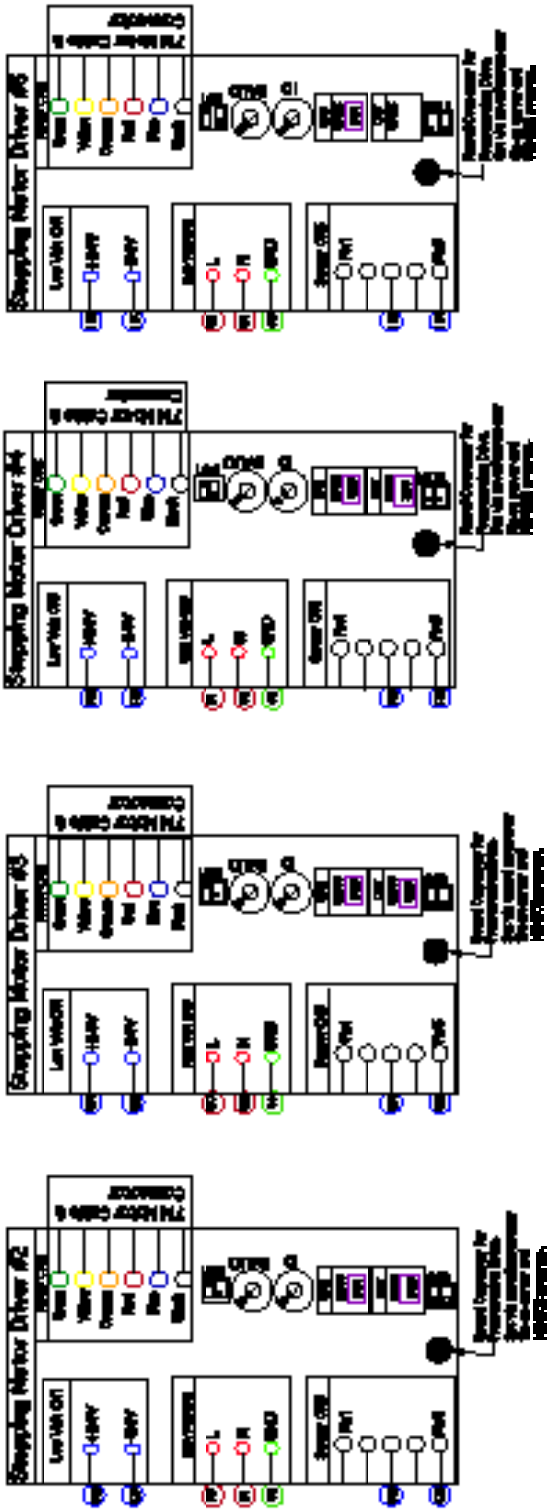
- EN 55024:1998
- EN61000-6-2:1999


415-100
PLC #1
Direct 06
D0-06DR
Power Supply
Zip Link Terminal Block
Motor Starter (Starter)
Variable Frequency Motor Drive (Blank Motor)
415-100


415-100
DIP Switches
1 2 3 4 5 6 7 8
DIP Switches
1 2 3 4 5 6 7 8
415-100


415-100 Extra Wire
Ethernet from port 1 to Ethernet on PLC
Ethernet from port 2 to upper socket in back of bar
Ethernet from port 3 to bottom socket in back of bar
Schematic-Wiring With Delta Drive
Scale: NONE
Material:
See Pick List
James L. Taylor Mfg. Co.
Poughkeepsie, N.Y., U.S.A.
3-25-08
BQ
415-100
Board Present Sensor Receiver
Board Present Sensor Sender
Length Measurement Encoder
415-100


Stepping Motor Driver #1
Ethernet Cable
Modbus Hub
CABLE 415-104
Optional Wires
14 ga. Yellow/Green
16 ga. Red
20 ga. Blue
12 ga. Black
14 ga. Yellow/Green
16 ga. Red
20 ga. Blue
Delta Servo Drive
415-100



415-100

Recomended Spare Parts

The following list contains the recommended parts to have on inventory to keep downtime of your automated opti-rip to a minimum.

Quantity	Part No.	Description
(1)	SWITCHPU.52	Black Head N.O. Contact Switch
(1)	SENSOR.35	Diffuse Laser Sensor
(1)	VALVE.76	Single Unit Valve
(1)	VALVE06FC.2	3/8” Flow Control Valve
(1)	VALVE06FC.3	3/8” BIMBA Flow Control Valve
(1)	VALVE06QE.2	3/8” QE3 Quick Exhaust Valve
(1)	ENCODER.20	Red Lion Encoder
(1)	LASER.14	Laser Light

Parts Order Form

1. Sold to:

Company _____
Address _____
Address _____
City _____
State _____ Zip _____
Your Name _____
Phone # _____
Fax # _____
Purchase Order # _____

2. Ship to:

Company _____
Address _____
Address _____
City _____
State _____ Zip _____
Attention: _____
Phone # _____
Fax # _____
Purchase Order # _____

3. Parts Needed:

Quantity	Part Name	Description	Price (each)

4. Preferred Shipping Method:

(check one)

☐ UPS Regular ☐ Truck ☐ Customer Pickup ☐ UPS Next Day Air
☐ Carrier: _____ ☐ Other:_____ ☐ Air Freight

5. Fax, Mail, or Phone your Order to:

Cameron Automation
130 Salt Point Turnpike
Poughkeepsie, NY 12603
Phone: (845) 452-3780
Fax: (845) 452-0764

Declaration of Conformity

We, James L. Taylor Mfg. Co.
130 Salt Point Turnpike
Poughkeepsie, NY 12603
(845)-452-3780
(845)-452-0764 Fax

declare under our sole responsibility that the product

#34H Rip Optimizing Machine
Model #34H-M1

to which this declaration relates is in conformity with the following standards and other normative documents

EN 292	Safety of Machinery, Basic Concepts, General Principles for Design
pr EN 1050	Principles for Risk Assesment
EN 294	Safety distances to prevent danger zones being reached by upper limbs
EN 60204	Electrical equipment for industrial machinery
EN 349	Safety distances to avoid crushing of human body
EN 60529	Touch distances for electrical equipment

following the provisions of the following directives.

89/392/EEC
91/368/EEC
93/44/EEC

The Technical Construction File is maintained at the above address.

Place of Issue: Poughkeepsie NY
Date of Issue:

Authorized Signature: