# Scanning Devices
Label Counting Table – Operating Manual
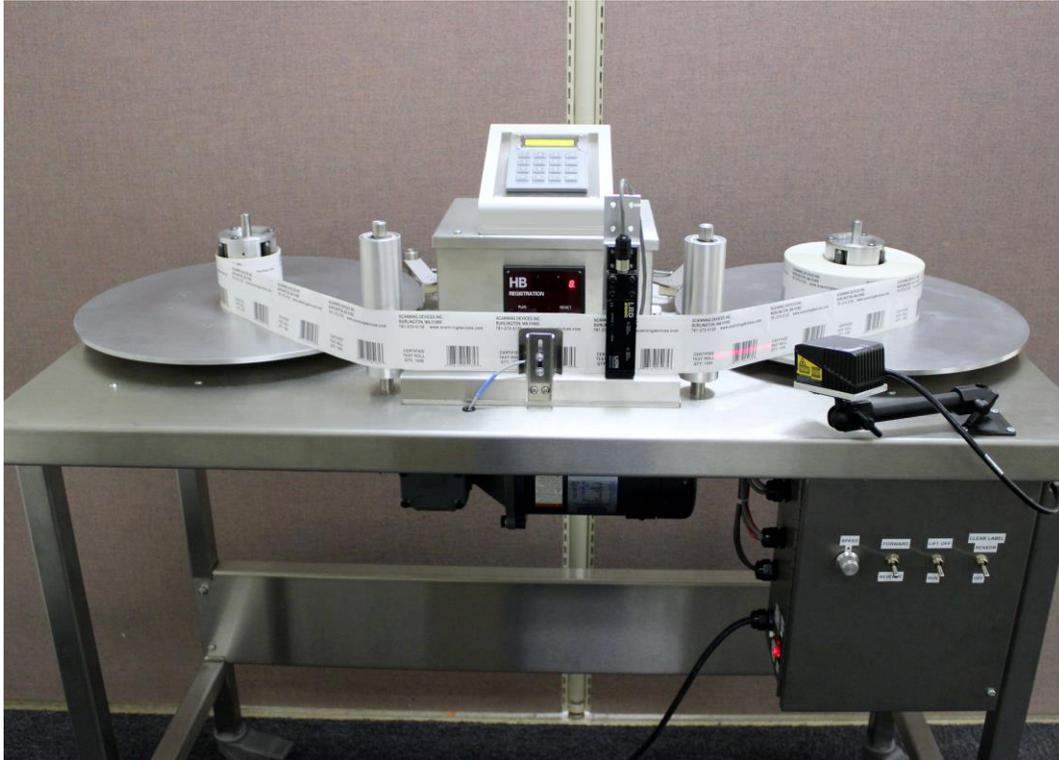
Scanning Devices

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Scanning Devices Label Counting Table – Overview

Your Scanning Devices Label Table is a critical tool for quality and manufacturing control processes. Its primary purpose is to validate the quantity, identity, and quality of labels and label rolls being used in any controlled incoming inspection or manufacturing process. When properly set up and operated it will count/validate labels at speeds of up to 1000 labels a minute (depending on label size). It will process a wide variety of labels by allowing fine-tuning/adjustments to sensors, tension control arms, and speed controls.

Your Scanning Devices label table is customized to your specifications with the features your organization has requested. A wide variety of special options are available on your machine including:

Special Label Table Options		
Bi- directional label processing – dual motor	18" diameter lift-off label discs	Barcode Verification
Clear Label Counting	Missing Label Detection	Constant Web Speed Option
Keypad w/ 2-line display	Electronic Break	Preset Label Counting
Jog Forward/Reverse	Label Table Validation Software Option	Computer Network Connection

Label Table Components

18" Removable Label Disks

Your Scanning Devices Label Table has two 18" lift-off label discs with 3" mechanical core chucks. It is a bi-directional table which means you can count in both directions and both label disks are independently powered by two electronic motors installed on the underside of the label table. When counting in the forward direction, (left-to-right as you face the front of the label table), the label disc on the right side of the table is the "Drive" or "Take-up" disk The alternative disk is called the "Supply" disk

The picture above shows an 18" lift-off label table disc with a mechanical tension control arm and special "lift-off" switch for easy removal of the label disk. The 18" lift-off disks sit on top of 13" disks slotted to accept pins that protrude from the bottom of the 18" disks.

In order to remove the lift-off disks you must first release the tension control arms by lifting the switch on the front panel of the lower control box. The switch is labeled "LIFT OFF"

The machine will not operate properly until the LIFTOFF switch is returned to the down RUN position.
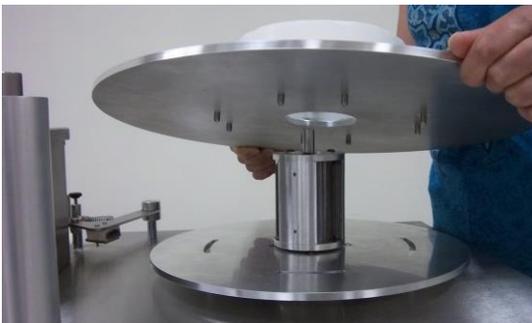
When counting large diameter rolls the operator may find that removing labels is easier to accomplish by "lifting off" the label disk and sliding the labels off the disk. To remove the disk, first release the tension control arms with the appropriate LIFTOFF switch, then grasp the disk on opposite sides and gently pull up. **IMPORTANT, the mechanical core chucks must be fully retracted to remove the Lift-Off disks. You can do this manually by spinning the corrugated core in the release direction.**

Tension Control Arms

The tension control arm (two are installed on bi-directional label tables) is provided to ensure that as labels are being processed the tension of the label web remains constant. <u>Tension is only applied to the "Supply" disk during label processing.</u> This helps to ensure consistent label roll winding tensions and minimizes telescoping of labels as the labels are wound onto the take-up core.

Adjustment nuts and thumb screw are used to increase the tension of the spring that applies pressure to the tension arm. Tension Pads are attached beneath the tension arm and make contact with the outer rim of the label disk. These pads are one of the few maintenance items that need periodic replacement.

Tension Control Arms can be roughly calibrated using a push-pull tension gauge. This will assist with more consistent tension settings between rolls.

Once the appropriate setting is established on the tension control arm, the round black locking knob should be hand tightened to assure tensions do not change during operation.

To determine the Tension setting, a "pull" tension gauge is applied to the flat riser on the Supply Reel Tension Control Arm. <u>Tension is only adjusted on the Supply Reel, not the Take-up Reel.</u> Once the correct tension is set, use the black locking dial to lock the adjustment screw in place.

TIPS:
- Small labels need relatively little tension applied to the supply disk (3-5 oz.), medium sized labels 3-5" +/- high need 12-16 oz., and large labels 6" and over need 24 oz. +/-.
- Proper tension on the supply roll is achieved when the labels being processed roll flat onto the take-up disc.
- Set a tension, start by running slower speeds, increase speeds as appropriate.
- If labels are telescoping (rising off of the take-up disc), try <u>reducing</u> the tension on the supply disc.
- Each label stock and label roll is different, try adjusting the tension until you find the tension, and speed that work best for that label, record what works and use it in the future.
- On large label rolls, if a tension setting cannot be found that eliminated telescoping, use the keypad to turn off the Constant Speed Option.

Electric Brake

The electric brake is offered as an option on label tables with features that require fast stops of the label web for inspection of missing labels, mis-matched bar codes, or splices. The Electronic Brake will engage to stop the web when a missing label is detected. This feature will also automatically release pressure from the tension control arm and the take-up real when counting/processing begins.

Label Web Guides
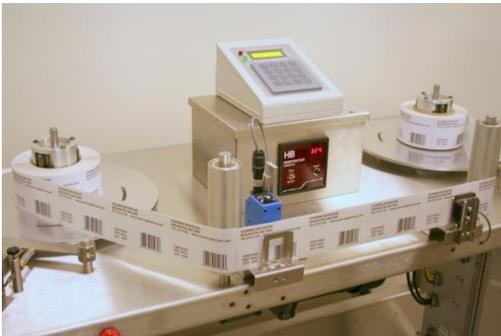
The labels to be processed are placed on the label disk on the left side of the label table (Supply Disk) with the labels unwinding from the left side, (counterclockwise rotation). The label web is fed in front of the left Label Web Guide with the backing facing the label guide. It then passes thru the counting station and across the front of the second label guide and is wrapped around a blank 3" corrugated core that is placed on the right side mechanical core chuck. Labels are wound onto the take-up disk in a counter clockwise direction as shown. This left to right processing is considered the Forward Direction for a bi-directional label table.

Counting Station

One of the most critical components on your label table is the Counting Station. Located at the center front of the Label Table, the Counting Station consists of a photo-sensor emitter/detector pair that establishes a light beam for sensing. The label web passes through this light beam as it moves through the counting station. The intensity of the light beam is adjustable and when properly set, the light beam "passes through" the web when the label backing alone is present and the light beam is "broken or blocked" when the backing and label are present together. This allows the sensor to distinguish between a label and a space between labels and determines the label count.

The emitted light beam is small, one-quarter inch in diameter, and the two components (emitter/detector) are mounted close together to focus on the label web. Alignment is important and is correct if the top and side surfaces of the components are in the same plane.

The sensor's vertical position is adjustable by loosening two set screws and moving the sensor up or down in the sensor bracket. Both sides (sensor and emitter must be adjusted to the same degree if the pair are to work properly together.   The emitter/detector components should be positioned so that the label moves through the light beam and will be broken by the label at one point for each label. A small screwdriver is required to loosen the components for movement and retighten when positioned.

The counting station also provides a web guide mechanism, delivering labels consistently and providing smooth movement to the take-up roll. The design of the guide protects the label web while it is moving at high speeds through the counting station.

Counter

This picture shows a standard Counter Display. The function of the counter is to respond to the photo-sensor at the counting station, to register counts on the light-to-dark transition (beam break) and display the current label count.   The counter shows the number of times the light beam has been broken since the last counter reset. The counter also houses the Run/Setup Switch and the Counter Reset Button.

A count is registered when point "A" in the diagram below passes through the light beam in the counting station. For a bi-directional counting table when labels are moving in the reverse direction, the count is registered at point "B".
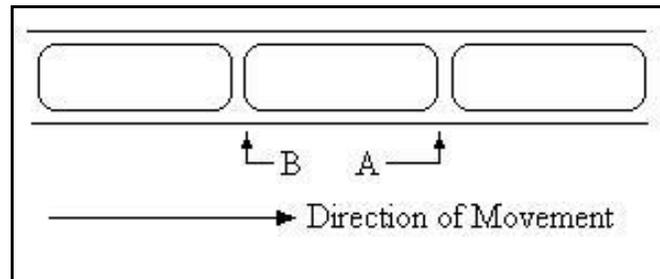
Label Counting Logic

The Counter houses the machines micro-processor and controls other critical functions of the machine. It feeds information to a connected computer, sends "read-me" timing signals to an attached barcode reader (optional), and more.

Counter Setup Switch

The counter's setup switch puts the counter in "Set-Up" mode allowing sensitivity adjustments for best optical contrast and sensing between label on web and spaces between labels. Adjusting the sensitivity to the specific label material being handled allows for the processing of a wide variety of label and label backing combinations.

For specific instructions for setup, see the Operating Procedures section of this manual. Once properly adjusted the switch is returned to the RUN position.

Counter – Reset Switch

The counter reset switch will reset the count to Zero when pressed. The reset switch is enabled when the motor speed switch is fully turned counter-clockwise to the OFF position.   <u>If the motor is running or the speed switch is ON, the reset switch is disabled.</u> To reset the counter, turn the speed switch to the Off position.

Counter – Signal Display

On the lower front plate of the counter are 11 LEDS that indicate the signal strength at the counter and are used to adjust the emitter/detector pair for different combinations of labels and backing materials. When properly adjusted, up to 6 LEDs to the right and center will illuminate when only the label backing is being viewed by the counters light beam. Up to 6 LEDs to the left and center will be illuminated when the label is being viewed by the light beam. While in Set-up mode, course and fine adjustments can be made to maximize the number of LEDS that are lit between backing only (right LEDs) and label positions (left LEDs). For accurate counting it is important to maximize the sensitivity setting on the sensors. See the detailed operating instructions for specific adjustment instructions.

Counter and End-Of-Roll

 The counter includes a "watchdog timer" to detect the end of roll and stop the motor at the completion of the inspection process. If no labels are detected in 3 label periods (the time it would take for three labels to move through the counting station), the counter declares that the end of the roll has arrived and stops the motor.

Counter and Constant Speed Control

The counter uses the sensor to measure the web speed passing through the counting station and adjusts the motor speed to keep web speed constant. This improves counting accuracy and is required when running Barcode Verification systems.

In some cases, you may wish to turn off the Constant Speed Option. This is possible by following the instructions on the machines keypad. See "Keypad & Display" later in this manual.

Counter and Missing Label Detection

The missing label detection feature operates by measuring the time taken by labels passing through the sensor. It uses the first few labels on a roll to establish a pattern. The counter then times each label as it is sensed and counted and establishes an expected time and tolerance for the next label to be sensed. If a label is not sensed within the expected time and tolerance, the counter declares the expected label "missing".

When a label is declared missing, the count/controller engages the electronic brake, stops the label web and displays an error message. The missing label feature is controlled through the machines keypad. See instructions for using the Keypad & Display later in this manual.

Keypad & Display

The keypad and display mounted on the center console provides an easy-to-use interface for machine start-up, operation, and other optional features. When the Label Table is first powered ON it displays a menu of action options to the operator. The display consists of two lines.

The keypad has sixteen keys as shown below:

The keypad and display are also used for display of error messages. Operator and error messages are described in detail in the section on messages.

Keypad Setup Menu

The setup menu is displayed when the Label table is first powered ON.

ENT Key
Use the ENT key to advance through the list of available options.

→ Key
Use the → key to toggle through the settings of a feature or to advance to additional instructions for a feature.

Once you have selected the setting you wish to use, press the **ENT** to select the option setting and move to the next setting options.

When you are ready to start counting go to the "Start Counting" Screen, press → (arrow key) and the Keypad will indicate you are "Ready to Start Counting". **Once you see this message, use the Speed Control Knob to start the machine by turning it clockwise.**

You can advance through the menu steps by pressing the ENT key, the options present in the following order:

Set Counting Up or Down
⇩
Start Counting
⇩
Barcode ON/OFF
⇩
Jog/Advance Web
⇩
Adjust Count
⇩
Connect to PC
⇩
Constant Speed ON/OFF
⇩
Missing Label ON/OFF
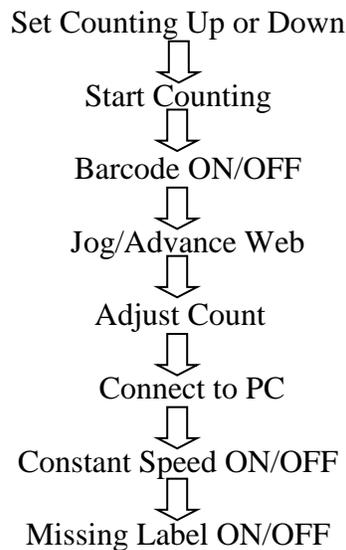
> Advance through the menu features by pressing the **ENT** Key on the Label Table Keypad.
>
> Use the → key to make specific selections.

Using the Counting UP/ Down Label Counting & JOG Features

Though many label counting operations simply focus on counting the number of labels in a roll (Counting UP). There a times when the user wishes to count a specific number of labels to be removed from the roll for a production operation.

When you use this feature, the Label Table will count out a specific number of labels and stop the web on the final label in the count. The last counted label will remain in the counting station in the center of the table.

To count down to a specific number of rolls set the options in the keypad as follows:

Scanning Devices Powering Up	Power up the Label Table and wait for the initial message to display below.
ENT NEXT → Chg Counting Down	Use this screen to select the Counting Down feature. Press the → (Arrow Key) until the display reads "Counting Down". Press the ENT Key to move to the next instruction.
ENT Next → Enter Quantity	The display will ask you to enter a quantity. Use the Keypad to enter the number of labels you wish to count then press the ENT key.
ENT Next → Go Start Counting	Press the → (Right Arrow) key to start counting.
Ready to Start Counting	The Label Table is now ready to start the counting operation. Turn the Speed Control knob to the ON position and set the speed to the desired speed level.
Adjust Speed to 5 ENT to Continue	The Label Table will begin to count out the number of labels selected. Prior to getting to the final count, the label table will stop and ask you to reduce the speed of the machine to speed setting 5. Adjust the Speed Control Knob to 5 and press the ENT key on the Keypad. The Label Table will slowly finish the counting process. The last label in the count will remain in the center counting station. Turn the Speed Control knob to the OFF Position.
ENT NEXT → Chg Counting Down	Once the count is complete, the initial message will appear on the Keypad. At this point you may both manually cut and remove the desired labels, or you may wish to JOG the machine forward so that the final label is no longer in the counting station. This will make it easier to cut the roll and remove the counted labels. To Get to the JOG feature press ENT key 4 times in succession. You will reach the JOG Command Line. (Note: Do not enter a quantity during this process, just simply press enter to pass this step and get to the JOG command line.)
ENT NEXT → GO JOG FWD/REV	At the JOG Command line press the → Key. Follow the instructions on the Keypad to advance the web. Remember: Jogging the web will not change the count. It will just move the web forward for cutting and removal.

Lower Control Panel

The control panel is equipped to support features included in your counting table's configuration.

The panel hangs below the right side surface of the table and provides controls to power the table motors as well as to setting features of the table. The primary controls of a Scanning Devices Label Table are as follow from Left to Right in the picture above:

(1) **Speed** - Motor speed control knob with integrated ON/OFF switch: starts and sets the motor speed. At the end of the roll or when the label web is stopped, **the switch must be turned OFF before the next roll can begin and the counter can be reset**. Power must first be turned ON at the master power switch for the motor control knob to work.

(2) **Forward/Reverse** – On this bi-directional label table (dual motors) this switch is set to determine the direction of label processing. The forward direction moves the labels from left to right on the table, the reverse direction moves the labels from right to left. It is recommended that the first count always be done from (left to right). The advantage of a bi-directional table is that the dual motors allow labels to be counted/processed a second time in the reverse direction, and allows easy rewinding of labels without moving the labels and label core from one disk to another.

This forward/reverse switch is interrogated when the motor speed switch is turned on to start web movement. **Be sure to set the switch before starting.** Changes in the switch position while the web is moving are ignored.

(3) **Lift Off** – This switch allows the user to release the pressure on the tension control arms and easily remove the 18" Lift-Off Discs. The Lift Off switch releases both tension control arms simultaneously. If you are removing the disks with labels on the machine, make sure the Core Chuck is rotated to move the grippers to their minimum position.

(4) **Clear Label Sensor -** Your table is equipped with a special sensor that has the capability of detecting and counting clear labels on clear label backing. It is controlled by

the Clear Label Sensor Switch on the Lower Control Panel. This is a separate sensor used only for the counting of clear labels. When the clear label switch is in the ON position the counting function moves from the center counting station to the clear label sensor. If you will be counting clear labels of any type, the clear label sensor switch must be turned to the ON position.   See instructions for installing Clear Label Sensor.

The Clear Label Sensor switch is interrogated when the motor speed switch is turned on to start web movement. **Be sure to set the switch before starting.** Changes in the switch position while the web is moving are ignored.
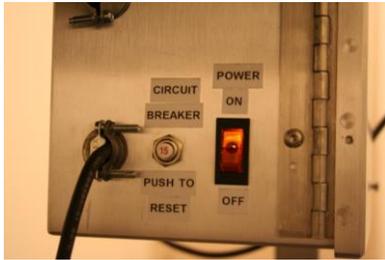
(5) **Lighted Power Switch**: controls all power to the table and is located on the left hand side of the main control box. This switch must be on to run your machine.

(6) **15 amp Circuit Breaker** is mounted to the left of the power switch. Push to Reset.

Motor Speed Control

The motor speed adjustment dial controls the speed of the drive motors on the counting table and the speed at which labels are counted/processed. If the label counting station is shut off (end of roll condition, missing label detection, bar code error) the motor speed adjustment dial must be turned fully counter-clockwise to the OFF position and then back clockwise to the ON position before the motors will re-start. From the fully counter-clockwise position, turn the motor ON by rotating clockwise until the desired motor speed is reached.

With the constant speed option ON, it is important to quickly establish the desired label processing speed soon after turning the motor speed dial to the ON position. The counter determines the speed of the roll early in the counting process and will try to adjust the speed of the motors to achieve the initial start-up speed. If during the counting process you wish to increase the speed of counting, turn the motor control dial to the full OFF position, and then turn it back on to the desired counting speed. It is not recommended that you start a label counting/processing operation at full speed with the constant speed option ON.

Setup Procedures

Counting Station – Photo Sensor Adjustment and Set-up

Prior to processing labels, and when changing between labels of different colors, thickness, and backing materials it may be necessary to adjust the sensors at the counting station for alignment, position, and sensitivity as outlined below:

A. Alignment – the counting station sensor consists of an emitter/detector pair aligned to project light through the label web toward the counter. The sensor is the component closest to the counter. The light beam is small and the two components are mounted close together to focus on the label web. Alignment is important and is correct if the top and side surfaces of the components are in the same plane.

B. Position - the sensor component should be positioned so that the label moves through the light beam and will be broken by the label at one point for each label. The system allows for vertical adjustment of the sensor light beam. A small screwdriver is required to loosen the components for movement and retighten when positioned. On very thin/short labels it is important that the emitter/detector pair is properly adjusted (lowered) so that the light beam passes over the labels and not above them. Once set, it is unlikely that the photo sensor position will require re-setting.

C. Sensitivity – changes to the sensitivity of the sensor for different types of labels and label backing materials is accomplished as follows:

With the machines mater power switch in the ON position, and the Speed dial turned to the OFF position, put the counter's front panel Run/Setup switch in the SETUP position (down). This will illuminate a row of lights on the lower edge of the counter. The setup objective is to move the lights from one side of center to the other when a label on the web backing moves into the sensor's light beam.

Adjust light sensitivity using the course and fine dials on the right side of the center console. Use the "coarse" dial first and the "fine" dial second. Adjust so that at least three lights are illuminated on the left side of the display panel when the label is positioned in the sensor's light beam. The more LEDs that light on each side during the adjustment process, the better the counting accuracy.

Follow the steps as outlined below:

First, move the web so that backing only, (space between labels), is in the sensor's light beam.

1. Setup Lights - when backing only is in the path of the sensor beam.

For best counting, the lights to the **right of center**, as shown in the photograph should be ON when the space between labels is positioned in the light beam (light projects through the label backing only).   Adjust the sensitivity with the course and fine adjustment dials on the right side of the counter so that all five lights are on when the backing only is in the sensor.

2. Setup Light - when label is in the path of the sensor light beam.

Next, move the web so that label is in the sensor's light beam. The lights to the **left** of center should be on when the label is positioned in the light beam, (light beam is broken by the label material plus backing).

Clear Label Detection

Your machine is provided with a clear label sensor shown here. This sensor is designed for counting clear labels on solid web backing or clear labels on clear web backing. The clear label sensor can be left in place when counting standard solid labels, it is recommended that the sensor is cleaned with some compressed air to remove any dust collection in the clear label sensor "sense" area.

To use the clear label sensor, select "Clear Label Sensor" switch on the front lower control panel of the label counting table. Then select the direction of counting, Forward or Reverse. **Finally, Always "Reset" the counter as a last step before beginning counting clear labels failure to do so may result in an incorrect count.** The "Reset button is located on the front panel of the HB Registration Counter.

Load the clear labels on the supply reel (left side for forward direction) feed the web through the clear label sensor and then through the counting station (as shown). It is important that the Clear Label Sensor switch be turned on before turning the motor speed switch on.

To remove the clear label sensor, simply remove the four screws on the back of the Clear Label Sensor Bracket also labeled "Remove Here". <u>DO NOT REMOVE THE CLEAR LABEL SENSOR BRACKET CONNECTED TO THE LABEL TABLE.</u> Once the four attachment screws are removed, the clear label sensor spacer and clear label sensor can be removed from the counting station area, or the sensor can be raised or lowered as needed.

The clear label sensor can also be adjusted to accommodate taller clear labels, simply re-attach the four attachment screws to different threaded screw holes in the bracket attached to the back of the clear label sensor itself.

Alternate attachment locations for taller clear labels.
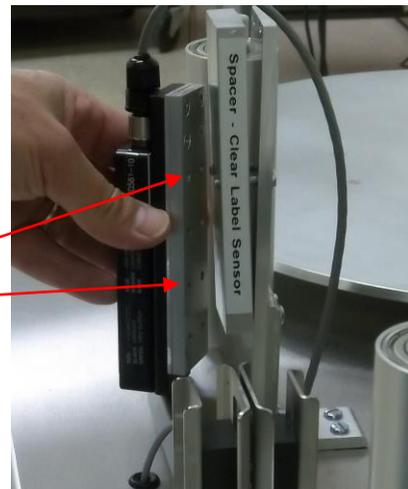
Barcode Verification

The Barcode Verification system is designed to read barcodes on labels as they move through the counting station to insure that barcodes are readable and correct. The counting sensor triggers the barcode scanner on the leading edge of the label. The barcode scanner attempts to read the label's code, compare it to the Target Barcode (the expected or "correct" code) and report the result.

Three outcomes are possible for each label:

1. Match – the code is readable and is the same as the Target Code
2. Mis-match – the code is readable but is not the same as the Target Code
3. No Read – no code could be read. This may occur because the code is printed poorly, missing from the label or in some way obstructed.

The barcode reader is capable of reading five different code types: UPC/EAN, Code 39, Code 128, International 2 of 5 Code, and Coda bar. For best results, only one code type may be activated at a time.

Detection and Verification are done by loading a "Target Barcode" into scanner memory on setup. When triggered by the counter, the barcode reader attempts to read a barcode printed on the label and compares any barcode read with the Target Barcode. It reports the result of the read operation as soon as it is known. For each trigger, it generates one of three outputs: match (the code read was exactly the same as the Target Code), no-code (the scanner did not read a code during the trigger period) or mis-match (a bar code was read but it was not the same as the Target Code).

At the start of the Bar Code Validation run, the user must set up the session by teaching the software the bar code type, the specific Target Barcode, and can read the bar code being read. The system learns the code type by attempting to read the label's barcode and reporting its result. The target barcode is also learned by reading a barcode. The barcode is displayed and loaded into the scanner. It remains in scanner memory until a different barcode is loaded.

Barcode Scanner Position

The barcode reader is a High Speed laser scanner. It uses a rotating mirror to construct a series of red scan lines. The scanner is mounted on a three-dimensional adjustable bracket, allowing the scanner to read codes with either horizontal or vertical positioning.

To read codes:

(1)   The red scan line must view the printed bar code in the middle of the bar code, square to the bars (not the top or bottom) to insure that it sees all the barcode lines. Bar codes can be validated in both directions, left-to-right and right-to-left.

(2)   The face of the scanner should be positioned 3" – 4" from the surface of the label.

(3)   The scanner should be positioned so that the bar code on a label is in view (the red line passes through it) when a label enters the center counting station the bar code reader is triggered (commanded to read). When the light beam is re-established at the end of the label, the bar code reader trigger is ended. If a barcode is not visible during the trigger period, a "No-Read" error will be declared.

(4)   When the Bar Code Reader is turned on, the connection to the PC is automatically turned OFF. The machine can only inspect bar codes when the PC connection is disconnected.

(5)   IMPORTANT, because the Bar Code Scanner is offset from the center counting station, there will be times when the Bar Code Reader is triggered by a label passing through the center counting station, but no bar code is present. It is important to recognize that this condition makes it impossible for the machine to inspect the first few labels and the last few labels on a roll. MANUALLY INSPECT the first few and last few labels on every roll.

When setting up a Bar Code inspection run, always start the count/inspection with the first label in view of the Bar Code Scanner. This will require that you adjust the count by adding the first few labels that pass through the counting station when you manually load the labels. It will also require that you manually inspect the first few and last few labels on the roll.

You can use the "Adjust Count" feature available from the keypad to add the number of labels that are not counted prior to starting the run to the total count.

Barcode Setup Commands – Via Keypad

| ENT Next → Chg BCode Off PC ON | Use this screen to turn the Bar Code Scanner ON/OFF. Press the → key to toggle the Bar Code Scanner between ON and OFF.

When the Bar Code Display is ON "BCode ON PC OFF" press the ENT key to advance to the desired command. You do not have to perform all these commands in order, rather press ENT to select the command you wish to perform. The most common is the Learn Target Barcode Command. |
|---|---|
| ENT Next → GO Learn Type | Use this screen to initiate the bar code scanner to learn the Bar Code Type. Press the → key to start the learn process. Follow the instructions on the keypad. |
| ENT Next → GO Learn Target Barcode | Use this screen to have the bar code reader learn the "Target Barcode". Press the → key to start the learn process. Follow the instructions on the keypad. |
| ENT Next → GO Read Barcode | Use this screen to have the bar code reader read a bar code on the web. Press the → key to start the read process. Follow the instructions on the keypad. The bar code numbers are presented on the keypad's screen. |

Label Table Operation

Steps of an Inspection Operation

It is advised that before counting/inspecting labels you read this operating manual completely. This section assumes that you understand the features, functions, and operating principles of the Scanning Devices Label Table.

1.   Set Initial Switch Positions & Keypad Settings

Start with switches in the following positions:
- Master Power Switch - ON
- Motor Speed – Off, (fully counter clockwise).
- Motor Direction Switch – Forward
- Clear Label Detection – Off (unless the label roll is a clear label and clear label sensor is installed)

2. Set the appropriate setting on the Keypad

Follow the instructions on the Keypad to set the options you wish to use. (See the "Keypad Setup Menu" section of this manual for details)
- Press → to begin counting

Pressing the ENT key takes you to the next set of instructions. Use the → key to select the option presented and the ENT to select the option setting.
- The default setting for Constant Speed Option is ON
- The default setting for Missing Label Detection is ON

Press Reset Button on the front of the counter control panel to set the starting count at "0"

3.   Mount Labels

A. Mount a roll of labels to be counted/inspected on the supply disc of the table (left hand side of table). Labels should unwind counter clockwise on the label table disc.

B. Mount an empty, corrugated core on the take-up disk, core chuck (right side of table). With your left hand, hold the label disk to keep it from rotating, simultaneously use your right hand to grasp the empty corrugated core and spin it to the right (clockwise). This will engage the mechanical locks and keep the empty core from spinning on the label table disk.

C. Draw the label web from the left (supply disc) in front of the left label guide.

D. Pass the label web through the counting station web guide and counting station. Feed the label web in front of the right hand label guide and then wrap the label web leader around the take-up spindle, or tape the leader to the empty label core. Always wrap the labels around the take-up core in a counter-clockwise direction.

4. Check Counter Setup/Adjustment

If the SETUP process as described in the SETUP PROCEDURES section of this manual have already been followed and the sensor is properly adjusted for the labels being processed, skip to F.

As the first label reaches the counting station/sensor, put the counter in "Setup" mode using the switch on the front of the counter/control unit and observe the setup lights. Make any final adjustments to the sensitivity if necessary with the course and fine adjustments at the right side of the counter enclosure so that the indicator lights advance equally to the right and left of the center position. See detailed instructions earlier in this manual.

5. Press Counter Reset Button (to clear counter to 0)

If you have adjusted the counting station sensitivity you may need to back up the label web so that no labels have yet passed through the counting station. Push the reset button on the counter to return the display to "0" (if necessary).

Note: It is possible to accumulate totals from consecutive rolls. Simply bypass the reset step. Counting will start from the displayed total rather than zero.

6. Clear Label Detector Operation

If you are counting Clear Labels, Select the Clear Label Sensor on the Control Panel, Install the Clear Label Sensor and Test Sensitivity Adjustments.

7. Set Tension Control Arms

Set the tension for the tension control arms to the proper setting. Using a Push/Pull Tension tool is helpful, but optional. See "Tension Control Arms" earlier in this manual for set-up directions.

8. Start Motor & Set Speed

Adjust the motor speed to the desired level by rotating the motor speed switch. *Remember to adjust the web speed to the desired level quickly, as the Constant Speed control function will take control of the web speed and over-ride adjustments you make to the speed switch. If you wish to reset the speed during web processing you must turn the speed control knob back to 0/OFF and start then reset the speed to desired level.*

9. End of Roll Detection

The counter declares end-of-roll if no labels have been detected by the sensors for 3 label periods or if the motor speed switch has been turned off.

10. Interpreting Results

The counter display shows the number of labels counted during the counting/inspection process.

If the motor is stopped before the end of the roll, the label in the counting station, if any, has been counted if it has advanced far enough to break the light beam. In this situation, the motor can be restarted and the count continues.

Operating Messages

Operator Messages	Type and Content
Scanning Devices Powering Up	Information Message: On power-up, the system displays this message while power stabilizes and runs diagnostics to ensure that memory and logic are operating properly. The message will be changed when the power up sequence completes. No action is required. The system powers up in setup mode. See Setup Messages.
ENT NEXT → Chg Counting UP	Use this screen to select if the operation will count UP (count the number of labels in a roll), or, count Down (count down to a specific number of labels). Use the → (Right Key) to toggle between UP/Down. Use the ENT Key to select the setting desired once it is displayed on the screen.
ENT Next → Go Start Counting	Action Required: To Start Counting press the → (Right Arrow) key. When the → key is Pressed, the display will read "Ready to Start Counting" Use the Speed Control Dial to start the counting operation. If you want to select other features first, use the ENT key to advance to the next setup selection.
ENT Next → Chg BCode Off PC ON	Use this screen to turn the Bar Code Scanner ON/OFF. Press the → key to toggle the Bar Code Scanner between ON and OFF. When the Bar Code Display is ON, you can follow the instructions to (1) Learn the Bar Code Type, (2) Learn the Target Barcode, or (3) Read the Barcode in view of the bar code scanner. Press the ENT key to get to these commands and follow the instructions presented.
ENT Next → GO Jog Fwd/Rev	Use this screen to Jog/Advance the label web (forward or reverse direction depends on the switch setting on the lower front control panel). Press the → key to advance one label, press the → key again to jog again. *NOTE: This feature is intended to be used with the countdown option, once a pre-set number of labels are counted, the last label will be positioned in the center counting station. You can either manually move the labels, or use the jog switch to advance the label web for easy cutting and removal of the pre-set amount. __The count is not adjusted when the jog feature is being used as it is assumed the counting operation is complete.__*
ENT Next → GO Adjust Count +/-	This feature is used to adjust the label count prior (or after) counting a label roll. This feature is helpful when counting labels without leaders, or when counting and using Bar Code Verification feature.
ENT Next → CHG Constant Speed ON	Use this screen to turn the Constant Speed option On/OFF. Press → to toggle the Constant Speed Option OFF/ON. Once the correct setting is displayed press ENT.
ENT Next → CHG Missing Label ON	Use this screen to turn the Missing Label option ON/OFF. Press → to toggle the Missing Label Detection Option OFF/ON. Once the correct setting is displayed press ENT.

OPERATING MESSAGES

These messages are presented by the Label Counting Table to the operator to provide status, action required, or error messages.

Operator Messages	Type and Content
COUNTING	Information Message: When the motor speed potentiometer is turned on, this message is displayed and remains displayed until an event occurs which stops the counting. The count is displayed on the face of the count/controller.
TURN MOTOR OFF	Action Required Message: In order to start a counting operation, the Motor Speed Dial must be turned fully counter-clockwise to the OFF position. When you see this message, turn the motor speed dial to the full OFF position.
Missing Label ENT to Continue	Action Required Message: A missing label has been detected and the label web has been stopped. Detection is based on time between labels. If the time between labels is more than 1.5 times the previous label time, the system declares a missing label and brings the label web to a stop. The specific action to be taken at this time depends on your installation protocol: recording the missing label, marking the label roll, rejecting the roll, etc. Press the Enter key on the keypad to allow the system to continue. Continuation is with the "Turn Off Motor" or "Ready to Start Counting" message.
End of Roll ENT to Continue	Action Required Message: The end of the label roll has been found as three label positions have passed without a label being detected. Examine the label web to verify that the end of the roll has been encountered. Press the Enter key on the keypad. The system will display the number of labels counted.
ENT to Continue Counted: nnnn	Action Required Message: This message displays the final count at the end of the roll. Record the count in the manner specified in your installation protocol. The count is also displayed on the face of the count/controller and should be the same number. If it is not, there is a problem with the counting sensing or logic. Press the Enter key on the keypad to allow the system to continue.
Turn Motor OFF	Action Required Message: When the system has taken action to stop the motor in response to the end of the roll or an error, the motor switch remains in the on position. To prevent re-start at high speed and potentially breaking the label web, the Motor Speed switch must be turned counterclockwise to the off position before continuing. The system waits until the switch is turned off and then advances to the next message. If the switch is turned off, this message is by-passed.

Trouble Shooting

From time to time, the user may make unanticipated or unexpected combinations of switch settings or button pushes that prevent the counting table from operating. Turning power off resets the counting table to a known state and allows it to restart on power on.

The Course and Fine photo sensor sensitivity adjustments are important to success in counting. Use the setup switch to display the light beam "break" and "make" levels for the labels being counted and adjust if necessary to achieve four lights on either side of center.

Maintenance & Cleaning

Each Scanning Devices label counting table is crafted with durable Stainless Steel for long life and low maintenance. Scanning Devices label tables require very little routine maintenance. Tension pads located on the tension arms that provide resistance to the label disks should be checked and replaced periodically. Drive belts do not typically need any maintenance or service.

Clean paper dust out of label path with soft cloth, vacuum or compressed air regularly. Wipe all stainless steel parts with lightly dampened cloth using warm water and mild detergent. Avoid getting and moisture/water on the counter, keypad, counting station, or other parts with electrical components. Always power off and unplug your label counting table when cleaning it. With proper maintenance your label table should give you years of reliable service.

Warranty and Repairs:

Every Scanning Devices label table comes with a year Factory Service Warranty against defects in materials and workmanship. Scanning Devices offers repair services in-factory in Burlington, MA. Label tables must be returned to Scanning Devices for repair. Alternatively on-site repair visits can be scheduled for an added cost that includes travel expenses to customer site. For warranty or repair service contact Scanning Devices, Inc. at 1-800-323-3347

<u>Contacting Scanning Devices</u>

Contact Scanning Devices for application help, trouble reporting, functional extensions or other products related to pharmaceutical manufacturing or regulatory compliance.

Scanning Devices Inc.
31 Dunham Rd., Unit #1
Billerica, MA 01821
Phone: 800-323-3347
FAX: 978-362-8693
Email: mail@scanningdevices.com
On the web: www.scanningdevices.com

Appendix A – Clear Label Sensor Adjustment

Follow the instructions provided by the manufacturer of your Lion Precision LRD2100 Sensor to make adjustments to sensitivity:

User's Guide
for the
LRD2100 and LRD2100C Label Sensors
from
Lion Precision
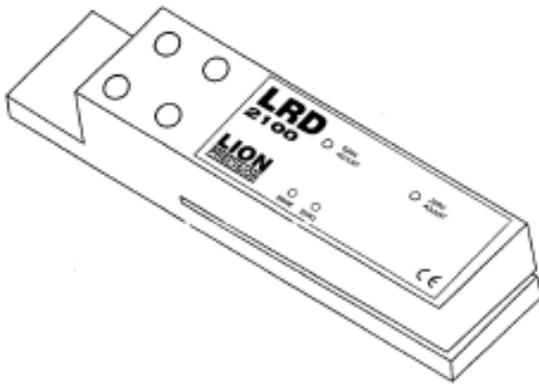
CE

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www.lionprecision.com
Document Number: M014-4660.025

LION PRECISION

Warnings:

Sensor body is connected to Ground.

Sensors must not be attached to voltages in excess of 30VRMS or 60VDC

All power must be off when installing the sensor.

Use of the equipment in any other manner may impair the safety and EMI protections of the equipment.

LRD2100 Wiring

Wire Color	Connection	Notes
Red	Vin (11-28V⎓)	50mA max.
Black	Ground	Connected to sensor body
Green	NPN Output	150mA max.
Blue	PNP Output	150mA max.
Brown	Output Polarity (light/dark switching)	+V or Ground See detail on back
Warning: Brown wire must be connected to +V or Ground for reliable operation.		
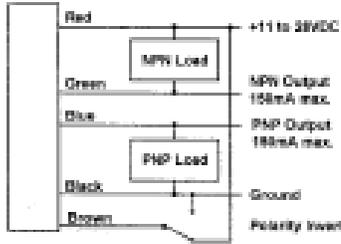
LRD2100C Wiring

Wire Color	Connection	Notes
1 (Brown)	Vin (11-28V⎓)	50mA max.
2 (White)	NPN Output	150mA max.
3 (Blue)	Ground	Connected to sensor body
4 (Black)	PNP Output	150mA max.
5 (Gray)	Output Polarity (light/dark switching)	+V or Ground See detail on back
Warning: Gray wire (pin 5) must be connected to Vin or Ground for reliable operation.		
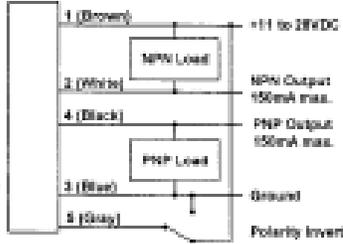
Connector on rear of sensor

Setup Procedure

These sensors are extremely stable and should not require re-adjustment after the initial setup. Re-adjustment will only be required for significant changes in label shape or thickness, or changes in power supply voltage.

1. Remove all material from sensor.

2. Center GAIN ADJUST

    Turn GAIN ADJUST four (4) turns counter clockwise.
    Turn GAIN ADJUST two (2) turns clockwise.
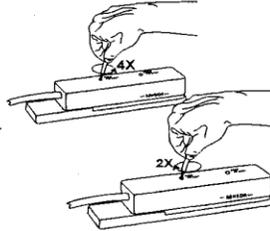
3. Set ZERO ADJUST

    Set ZERO ADJUST to the point where the ZERO light just begins to come on.

    It is not important whether the light is on or off. What is important is that the light is very near the point where it changes from off to on.

4. Set GAIN ADJUST

    For most labels, GAIN will need no further adjustment. If the sensor performs errattically, use the following GAIN adjustment procedure.

    Insert material into sensor.

    While moving labels through the sensor, Set GAIN ADJUST to the point where the OUTPUT light (EDGE on some models) starts to flash. Then continue turning ½ turn clockwise.

    Start of Output flash plus ½ turn
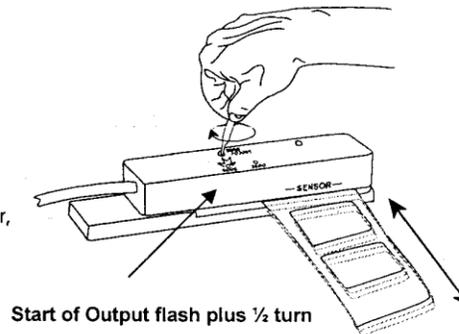
5. Sensor is now ready.

Lights During Operation:

The Output light (Edge on some models) indicates the sensor output. It will be in one state (on or off) during the label and the other state during the gapdepending on the direction of the label movement and the connection of the Polarity Invert wire (see next page for details).

The Zero light is for setup only and is meaningless during operation.

Notes:

1) For best results, web should ride against sensor baseplate, not "float" in the gap.

2) Some inks, usually black, have a high carbon content. These inks behave like metal and may not work reliably with the LRD2100. Use the LRD6110 instead.

Output and Mechanical Detail

Light/Dark switching is affected by the direction of label movement and the Output Polarity connection. Output descriptions below are for web direction indicated in the illustration and **are reversed** for web movement in the other direction.

Web Movement Direction

Dark Switching
Output Polarity = GND

⊗   -☼- ←— Output Indicator*
                ←— Outputs

Light Switching
Output Polarity = +V

-☼-   ⊗ ←— Output Indicator*
                ←— Outputs
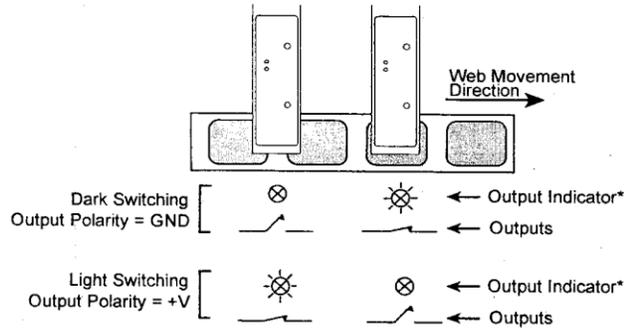
*Some models label this indicator as "Edge"

M4x.7 (x4)

5.50" / 140mm
1.25" / 31.8mm
0.80" / 20.3mm
1.00" / 25.4mm
0.20" / 5.1mm
0.60" / 15.2mm
1.20" / 30.5mm
0.60" / 15.2mm
0.30" / 7.6mm
Gap 0.03" / 0.76mm (Adjustable)
3.50" / 89mm Throat Depth
0.95" / 24.1mm
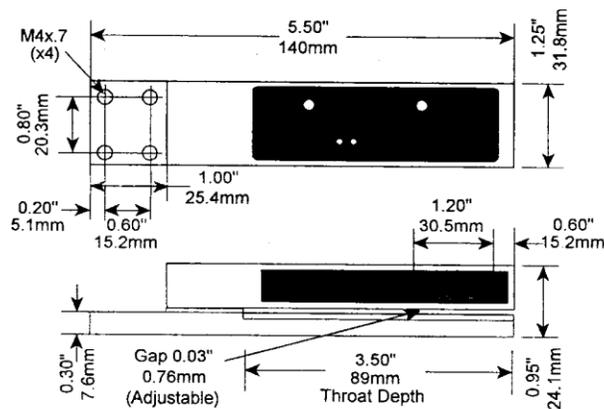
Specifications

Power supply	Voltage	11-28 V⎓ (reverse polarity protected)
	Current	50mA
Response time	on or off	$20\mu s$ max
	Switching Frequency	10kHz max
Output	Output Current (sinking or sourcing)	150mA max (overload protected)
	Switching output	PNP (sourcing) or NPN (sinking), Dark or light switching
Temperature	Operating Range	40°F to 140°F (4°C to 60°C)
Protections	Supply	Inverse Polarity Protection
	Switching output	Short Circuit and Overload Protection

Two-Year Warranty details at: www.lionprecision.com/warranty.html

Appendix B – Keypad/Software Logic Diagram.

```
                      ┌──────────┐
                      │  Start   │
                      └────┬─────┘
                           │
┌───────────────────────┐  →  ┌──────────────────┐
│ Display Count Up or Down│────→│  Change Up/Down  │────────→
└───────────┬───────────┘      └──────────────────┘
            │
        ┌───────┐
        │  Ent  │
        └───┬───┘
            │
          ◇ ? ◇ ──(D)──→ ┌──────────────────────────────────┐
            │            │ Enter Quantity                   │
          (U)            │ Numeric Keys – add digit         │
            │            │ CE/C – remove last digit         │
            │            │ AC – remove all digits           │
            │            │ Ent – record entry and continue  │
            │            └──────────────────────────────────┘
            │
   ┌─────────────────┐   →                        ┌──────────┐
   │ Start Counting  │──────────────────────────→ │  Count   │
   └────────┬────────┘                            │  Action  │
            │                                      └──────────┘
        ┌───────┐
        │  Ent  │
        └───┬───┘
            │
   ┌─────────────┐   →   ┌──────────────┐
   │ Barcode / PC│──────→│ Change on/off│
   │   On/Off    │       └──────────────┘
   └──────┬──────┘
          │
        ◇ ? ◇ ──(O)──→ ┌────────────────┐  →  ┌──────────┐
          │            │ Learn Code Type│────→│ Read &   │
        (Off)          └────────┬───────┘     │ Report   │
          │                 ┌───────┐         └──────────┘
          │                 │  Ent  │
          │                 └───┬───┘
          │            ┌────────────────────┐  →  ┌──────────┐
          │            │ Learn Target Barcode│───→│ Read &   │
          │            └────────┬───────────┘     │ Report   │
          │                 ┌───────┐             └──────────┘
          │                 │  Ent  │
          │                 └───┬───┘
          │            ┌────────────────┐  →  ┌──────────┐
          │            │  Read Barcode  │────→│ Read &   │
          │            └────────┬───────┘     │ Report   │
          │                 ┌───────┐         └──────────┘
          │                 │  Ent  │
          │                 └───────┘
          │                                   ┌──────────────┐
          │                                   │ Back to Start│
          │                                   └──────────────┘
      ┌────────┐
      │  Next  │
      │  Page  │
      └────────┘
```

30

```
                    ┌──────────┐
                    │ Previous │
                    │ Page     │
                    └────┬─────┘
                         │        ┌─────────────────────────────────────┐
                         ▼        ▼                                     │
                    ┌────────┐   ┌───┐   ┌──────────────────┐   ┌──────────┐
                    │  Jog   │──▶│ → │──▶│ Advance 1 label  │──▶│ Jog Again│
                    └───┬────┘   └───┘   │ or 1 second      │   └──────────┘
                        │                └──────────────────┘
                        ▼
                    ┌────────┐
                    │  Ent   │
                    └───┬────┘
                        │                        ┌──────────────────────────────────┐
                        ▼        ┌───┐            ▼                                  │
                 ┌────────────┐  │ → │   ┌───┐  ┌────────────────────┐               │
                 │Adjust Count│─▶│   │─▶ │ + │─▶│ Increment Count    │───────────────┤
                 └─────┬──────┘  └───┘   └───┘  └────────────────────┘               │
                       │                  ┌───┐  ┌────────────────────┐              │
                       ▼                  │ --│─▶│ Decrement Count    │──────────────┘
                 ┌────────┐               └───┘  └────────────────────┘
                 │  Ent   │        ┌────────┐
                 └───┬────┘        │  Ent   │
                     │             └────────┘
                     ▼
                  ◇ PC On ◇ ──Y──▶ ┌──────────────┐   ┌───┐   ┌──────────┐
                     │             │ Connect to PC│──▶│ → │──▶│ Open PC  │
                     N             └──────┬───────┘   └───┘   │ Link     │
                     │                    │                   └──────────┘
                     │                  ┌────────┐
                     ▼                  │  Ent   │
          ┌────────────────────┐       └────────┘
          │Constant Speed On/Off│──▶ ┌───┐ ──▶ ┌──────────────┐
          └─────────┬──────────┘     │ → │     │ Change On/Off│
                    │                └───┘     └──────────────┘
                    ▼
               ┌────────┐
               │  Ent   │
               └───┬────┘
                   ▼
          ┌────────────────────┐
          │ Missing Label On/Off│──▶ ┌───┐ ──▶ ┌──────────────┐
          └─────────┬──────────┘     │ → │     │ Change On/Off│
                    │                └───┘     └──────────────┘
                    ▼
               ┌────────┐
               │  Ent   │
               └───┬────┘
                   ▼
           ┌──────────────┐
           │Back to Start │
           └──────────────┘
```