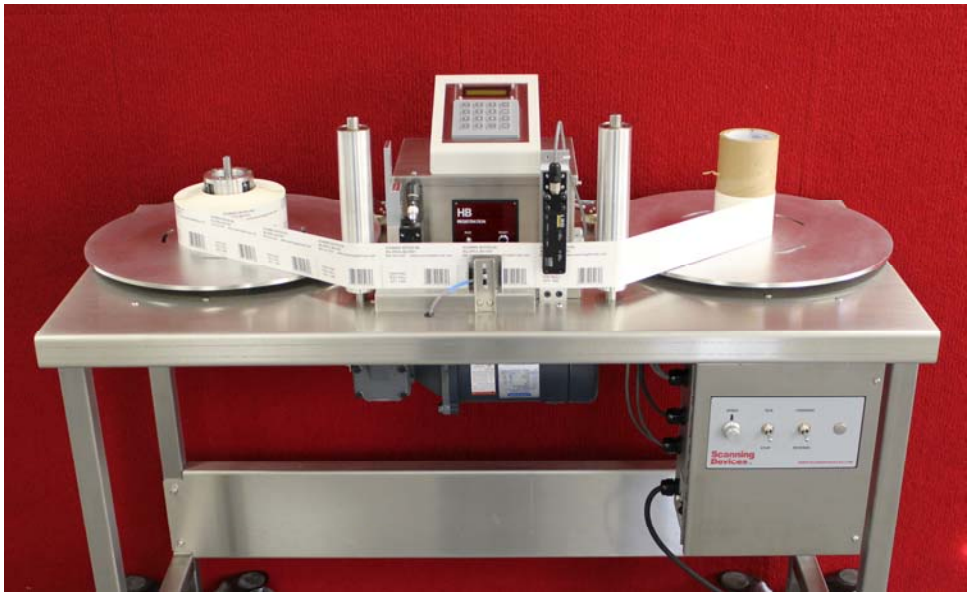
Scanning Devices
Label Counting Table – Operating Manual



Scanning Devices

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Scanning Devices Label Counting Table – Overview

The 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*) with 100% accuracy. It will process a wide variety of labels by allowing fine-tuning/adjustments to sensors, tension control arms, and speed controls.

The Scanning Devices label table can be customized with special features and options to satisfy specific requirements. A wide variety of special options are available on Scanning Devices Label Tables including:

Special Label Table Options		
Bi- directional label processing – dual motor	18” diameter lift-off label discs	Clear Label Counting
Missing Label Detection	Splice Detection	Barcode Verification
Electronic Brake	Preset Label Count & Count Adjust Option	Constant Speed Option
Jog Forward/Reverse	6”, 3”, and 1” Core Chucks	5” Locking Casters
RS232 Connection	Count Reporting and Record Keeping Software	Validation Software

* Note: With motor speed adjustment set to maximum, a roll of 1000 4-inch labels is processed for counting in 1 minute. Counts per minute vary with motor speed settin, size of label and size of roll. Please contact Scanning Devices for more details.

Label Table Components

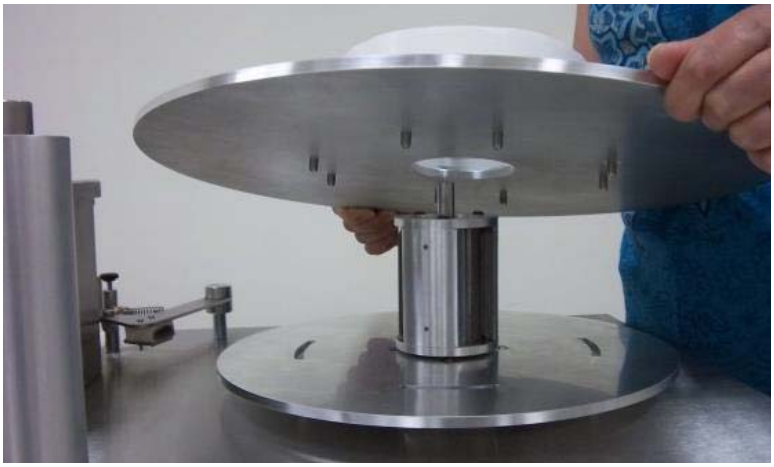
18” Lift-off Label Disks

Each Scanning Devices Label Table has two 18” Lift-off label discs with 3” mechanical core chucks. It is a bi-directional machine which means it can count in both directions, or, count in one direction and then rewind the counted label roll. Both label disks are independently powered by two separate electric 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 disks. 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 LIFTOFF switch on lower control panel, 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. Tension is only applied to the "Supply" disk during label processing. 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 or decrease 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.

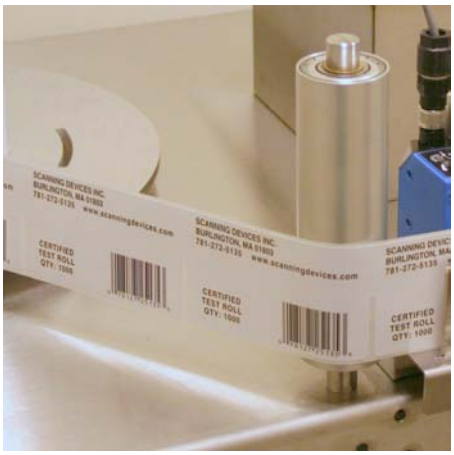
To determine the Tension setting, a "pull" tension gauge is applied to the flat riser on the Supply Reel Tension Control Arm. Tension is only adjusted on the Supply Reel, not the Take-up Reel. Once the correct tension is set, use the black locking dial to lock the adjustment screw in place.

TIPS for Tension Adjustments:

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 reducing the tension on the supply disc.
- If the label web is loose and flapping during counting try slowly increasing tension on the supply disc.
- **Use the least amount of tension required. Excess tension can result is clutch slippage at end of roll.**
- 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.
- Most labels need relatively little tension applied to the supply disk (8-10 oz.), some rolls may need more tension (10-16 oz.). **Try starting with the lowest possible tension and working up slowly as needed.**

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 the 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, 1/8th 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.

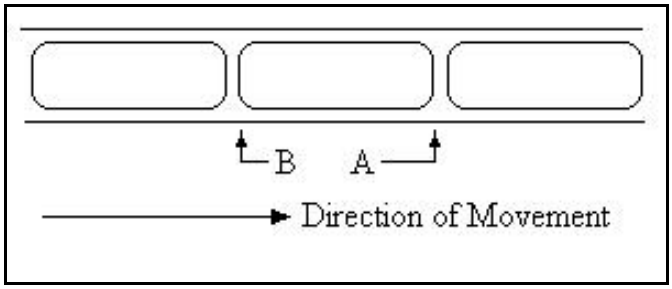
The sensor's vertical position is adjustable by loosening two set screws and moving the sensor up or down in the sensor bracket. **Both sides (sensor and emitter must be adjusted to the same degree if the pair are to work properly together.** The emitter/detector components should be positioned so that 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

The picture on the left 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". This point is often referred to as the "leading edge" of the label being counted.



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 <u>only</u> enabled when the motor speed switch is fully turned counter-clockwise to the OFF position. If the motor is running or the speed switch is ON, the reset switch is disabled.** To reset the counter, first 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 (thicknesses) 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.

Keypad & Display

The keypad and display mounted on the center console provide 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:

1	2	3	→
4	5	6	AC
7	8	9	CE/C
+	0	-	Ent

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 press ENT until you come to the "Start Counting" Screen, then press → (arrow key) and the Keypad will indicate you are "Ready to Start Counting". **Once you see this message, turn the RUN/STOP switch to the RUN position and then use the Speed Control Knob to start counting by turning it clockwise.**

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

Start Counting
⇩
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.

Lower Control Panel

The control panel is equipped to support features included in the 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** - 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. From the fully counter-clockwise position (0), turn the motor speed up 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. 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. It is not advisable to try to change the speed of counting once the counting speed has been initially established for a counting operation.

(2) **RUN/STOP** - The RUN/STOP switch must be set to the RUN position to start counting. It must be turned to the STOP position at the end of the counting process. **The RUN/STOP switch must be moved to STOP position before you can reset the counter to 0 and begin counting another roll.**

(3) **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. The forward/reverse switch is interrogated when the RUN/STOP switch is turned to the RUN position. **Be sure to set the FORWARD/REVERSE switch before selecting RUN.** Changes in the switch position while the web is moving are ignored. 13

(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 the machine.

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

Installing Core Chucks

Core chucks link label cores to the motor drives and tension controls on the Label Counting Machine. Chucks operate with movable grippers that engage the inside of the label core. As rotational torque is applied to the chucks, grippers move outward in the direction opposite the applied torque to make contact with the core. Chucks are installed on spindles and secured with a 3/16" Allen wrench. Chucks install correctly only one way and care must be taken to install them with proper orientation. If installed up-side-down, grippers will not engage the cores and the machine will not operate.

Three-inch Core Chucks

Three inch cores are secured with one 3/16" Allen socket set screw. The chuck on the left reel (as viewed from the front of the table) is mounted with the Allen screw on the lower half of the chuck so that the grippers move in the opposite direction as applied torque.

Figure 2: Left Reel Chuck, Allen Screw Below

The chuck on the right reel (as viewed from the front of the table) is mounted with the Allen screw on the upper half of the chuck (up-side-down as compare to the left chuck) so that the grippers move in the opposite direction as applied torque. Secure the Allen screw tightly when installing chucks so they do not slip on the spindles.

Figure 12: Right Reel Chuck, Allen Screw Above

Six-Inch Core Chucks

Six inch chucks require two 3/16" Allen screws to secure them the spindles. Six-inch chucks also install only one way. Care must be taken to install them correctly for proper operation of the machine. The six-inch chuck mounts so that the grippers move in the opposite direction of rotation when labels are being rolled onto the core on the chuck. Notice the red direction-of-rotation arrows and black gripper movement arrows in the photos are in opposite directions. Secure both Allen screws tightly with a 3/16" Allen wrench.

Figure 3 Left Reel Six Inch Chuck

After installing core chucks, mount label roll elevators (See next page).

Figure 4 Right Reel Six Inch Chuck

Mounting Label Roll Elevators

After installing core chucks, mount two appropriate label roll elevators, 3” or 6” diameter center hole, over the core chucks. Align the elevators so that the locating pins on the undersides drop into the slots on the machine’s disks.

Then rotate the elevators as shown in the photo below: counter-clockwise for the left elevator, clockwise for the right until the pins stop at the end of slots.

Elevators may be useful in lifting label rolls off the machine. Lift the elevators to slide rolls up and off the core chucks, then slide the label roll off the elevator. This is especially effective for thin label rolls.

Figure 5: Mount the label roll elevators over the core chucks and rotate until the pins reach the ends of the slots.

Counting Station - Photosensor Adjustment and Set-up (Solid/Paper labels only)

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 through the middle of the labels and not above them. Once set, it is unlikely that the photosensor position will require re-setting.

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

With the machines main 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.

If the machine is equipped with a Clear Label Sensor, the sensitivity adjustments for that sensor are on the Clear Label sensor itself. Above procedure is to adjust the sensitivity of the sensors used for solid paper or other solid type labels only.

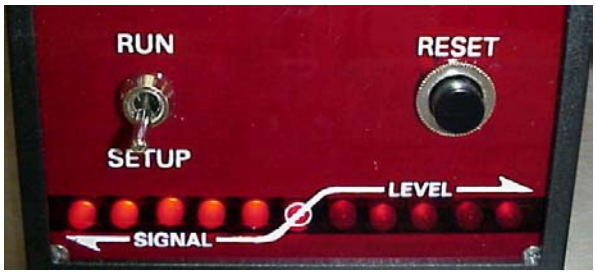
Follow the steps as outlined below to adjust the sensor:

Load the labels you want to count onto the machine. Move the label web so that the backing only, (space between labels), is in the sensor's light beam. This should cause the lights on the right side of the counter to illuminate.

6. 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.

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



Next, move the label web so that a 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). Adjust the coarse and fine adjustment knobs to maximize the number of lights being illuminated.

Now move the web so that the gap between the labels is positioned in line with the emitter and detector. Ensure that there are at least 3 or more LEDs still lighting in this position.

As you move the web back and forth in the counting station, the lit LEDS should move from the Left side of the panel to the Right side. Continue to adjust the adjustment knobs so as many of the 6 available LEDs are lit in the left and right position.

When you have finished correctly adjusting the sensor, by moving the label material back and forth in the counting station, the LEDs should jump back and forth between the left and right side of the panel. **The more LEDs that light on each side during the adjustment process, the better the counting accuracy.**

When the process is complete, return the set-up switch to the RUN position.

Label Table Options

Constant Speed Control

The Constant Speed Control Feature uses the sensor to measure the web speed passing through the counting station and adjusts the motor speed to keep web speed constant. This can make counting larger rolls easier by maintaining a constant speed throughout the counting process. This feature is also required to support other optional features like Bar Code Verification and Missing Label functions.

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.

When using the Constant Speed function it is important to recognize that you need to set the initial speed of the operation and then let the machine control the speed thereafter. The software evaluates the early initial speed of the counting operation (within the first 40 labels) and then determines the speed of counting. Thereafter if you try to adjust the speed of the machine using the speed dial, the software will try to re-adjust the speed of the machine back to its initial operating speed.

If you are counting a roll where you need to speed up, or, slow down the speed of count during the counting process, turn off the Constant Speed Option using the keypad. This will allow you to make speed adjustments during the counting operation.

Missing Label Detection & Electronic Brake

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".

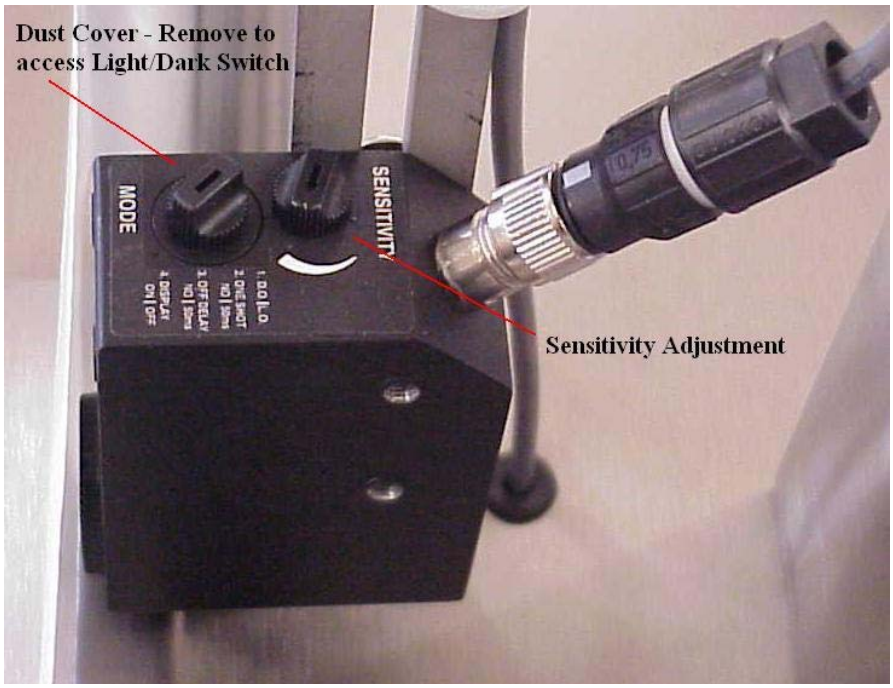
When a label is declared missing, the count/controller engages the electronic brake, stops the label web and displays a Missing Label error message. Count accuracy is maintained throughout the process. The missing label feature is controlled through the machines keypad. See instructions for using the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

Splice Sensor

The splice detector is a color sensitive sensor installed adjacent to the counting station. It is designed to detect colored splice tape commonly used in label fabrication. When splice tape passes through the counting station, the splice detector senses the color change between web backing and splice tape. It generates a signal to the count-controller to stop the web and generate an error message on the keypad LCD screen. It is up to the operator to take action based on the presence of the splice.

Splice Detector Setup

The splice detector has two setup features that may need occasional adjustment:



1. Dark or Light Output – splice tape is typically red and is adhered to white web backing in order to provide a contrast at the splice. The sensor should be set to Dark Output (D/O) to generate its output when the dark (Red) condition is detected. Alternately and rarely, white splice tape may be used on dark-backed webs. In this case, the sensor should be set for Light Output (L/O) to detect and signal this splice condition.

Dark or Light Output is selected by a switch mounted under a dust cover on the top of the sensor.

2. Sensitivity adjustment – a ten-turn potentiometer adjustment located on the top of the sensor is used to set the light level for switching. A light bar on the back of the sensor displays the light level. When the light bar crosses the mid-point of the display, the sensor switches its output. Adjust the sensitivity so that the light bar moves from one end of the display to the other when the splice tape is in the scanner's view.

The splice sensor is turned off/on using a switch on the side of the upper control panel. Turn the splice sensor off when not in use or when a splice-stop is not desired.

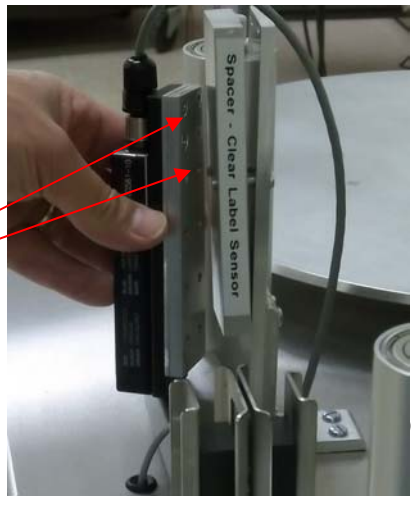
Clear Label Counting

The machine is provided with a specialized 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. The Clear Label Sensor is adjusted at the factory and should not need further adjustment. If it does see the appendix at the end of this manual for instructions.

To use the clear label sensor, select "Clear Label Sensor" switch on the upper right side of the top control box 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 the center 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 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 two attachment screws are removed, the clear label sensor spacer and clear label sensor can be removed from the counting station area, and 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 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.

Label Table Operation

Steps of an Inspection Operation

It is advised that before counting/inspecting labels you read this operating manual completely.

1. Set Initial Switch Positions & KeyPad Settings

Start with switches in the following positions:

- Master Power Switch – ON
- RUN/STOP switch - STOP position.
- Motor Direction Switch – Forward
- Motor Speed Dial – Set to 0

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 ENT key until the display screen reads "Start Counting"
- Press the → key to begin counting display reads "Ready to Start 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 (if option included)
- The default setting for Missing Label Detection is ON (if option included)

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

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 the left hand, hold the label disk to keep it from rotating, simultaneously use the 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 4.

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. 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. It is advisable to use as little tension as necessary as too much tension can cause labels to telescope, or can cause clutch slippage at the end of counting a roll.

7. 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 and set the motor speed to the desired level.*

8. 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.

9. 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.

10. Operating Messages - Keypad

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. Note: to start the machine for Validation, press and release the Reset button on the red faceplate once while this message is displayed.
ENT Next →: Go Start Counting	Action Required Message: Select Start Counting action. Press the → (Right Arrow) key to exit the setup procedure to start counting. Press the ENT (Enter) key to advance to the next setup selection.
ENT Next →: Go Adjust Count	Action Required Message: Select Adjust Count action. Press the → (Right Arrow) key to exit the setup procedure to adjust the count on the display. Use the + or – keys to make the adjustment. Once the desired count is displayed, press ENT (Enter) key to go back to the Start Counting selection. Press the ENT (Enter) key to advance to the next setup selection.
ENT Next → GO Connect to PC	This feature is used after a count is complete and you wish to transfer the data in the counter to a connected PC. A null modem cable (supplied with table) must be connected to the back of the keypad control box and to a local PC with Scanning Devices Software installed.
ENT Next → Change Constant Speed ON	Action Required Message: Press → to toggle the Constant Speed Option OFF/ON. Once the correct setting is displayed press ENT.
ENT Next → Missing Label ON	Action Required Message: Press → to toggle the Missing Label Option ON/OFF. Once the correct setting is displayed, press ENT.

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

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.
Switch to Stop	Action Required Message: In order to start a counting operation, the RUN/STOP switch must be moved from the STOP Position to the RUN position. When you see this message, turn the RUN/STOP switch on the lower front panel to the STOP position.
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 the 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.
PC Link Opened Reset to Exit PC	This message is displayed when an active connection is made between the Counter and the connected PC. In this mode the user can open the Scanning Devices Software and transfer data to the PC for record keeping purposes. This mode is also used to run the Scanning Devices Label Table Validation Software. Press the RESET button on the front of the HB Registration counter to exit this mode and begin a new counting operation (same action as if you were resetting the count to 0).

Barcode Verification

Barcode Operations

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.

If Sequential Barcode Verification is selected, a sub-set of the label's barcode may be used as the target. See the keypad setup instructions, page 26 for details on how to specify barcodes for sequential verification.

IMPORTANT: the barcode being defined using the Learn Target Barcode keypad command must be the first barcode read when the barcode verification run is started. After the barcode is read and verified, the target barcode is incremented or decremented to form a new target for verifying the next label's barcode. If the target barcode is read from the first label on a label roll, insure that the roll is re-wound slightly so that the barcode will not be visible to the scanner when the machine starts but will move into view as the first barcode the scanner encounters.

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.

Sequential Barcode Inspection

IMPORTANT: Start the barcode verification run on the correct label

The target barcode may be taught by reading a barcode from a "job" sheet or from a barcode on the label roll. In either case, the barcode read as the target barcode MUST be the barcode on the first label that is inspected by the scanner after the start of the machine. When the first label is inspected, the barcode entered as the target code is used to verify the first label's barcode and then incremented or decremented to form a new target for verifying the next label's barcode. If the second label's barcode is read first, it will not match the original target code and an error will be reported. Be sure to position the label roll so that the original target barcode will be the first barcode inspected.

Barcode Operations 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. Barcode reading requires that the constant speed option is on. When the Bar Code Scanner is turned on, the constant speed option is turned on automatically. When the Bar Code Scanner is turned off, the constant speed setting is returned to its previous state, on or off.
ENT Next → Chg Sequential OFF	Use this screen to enable or disable sequential barcode inspection. With Sequential OFF, inspection compares each label with the same target barcode. With Sequential ON, inspection checks codes against the current "Target Barcode" then increments or decrements the target to check the next code. Sequential operates with numeric data only, no alphabetic characters. Press the → key to change the setting.
ENT Next → Chg Match Start 6	If Sequential inspection is Enabled (ON), this screen is displayed. Use this screen to specify the beginning of the target portion of the barcode. The current start position of the match is displayed. To determine the start, count characters from the left starting with 1. For example: If the starting barcode is "ABCDE1234", match start is "6".Use the → key to enter a different start position.
ENT Next → Chg Match Len 4	If Sequential inspection is Enabled (ON), this screen is displayed. Use this screen to specify the length of the target within the barcode. The current length of the match is displayed. For the example above, match length is "4". Use the → key to enter a different length.
ENT Next → Chg Sequence UP	If Sequential inspection is Enabled (ON), this screen is displayed. Use this screen to specify the direction the target changes (up 1 or down 1) after each barcode is inspected. For the example above, after inspecting "ABCDE1234" the target is increments to "1235" if Sequence is UP or decrements to "1233" if Sequence is DOWN. Note that the portion of the barcode not included in the match "ABCDE" is not inspected, but must be present in the barcode.
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.

Troubleshooting

Machine Not Responding to Controls as Expected - 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 main power switch OFF resets the counting table to a known state and allows it to restart with default settings.

Cannot Reset Counter to 0 – Turn the Motor Speed Control knob on the lower right control panel to the OFF position, then reset the counter by pressing the Reset Button. Counter can only be reset when the motor speed control knob is in the OFF position. If this does not work, also be sure that the Keypad Command is at "Ready to Start Counting" command line.

Inaccurate or Inconsistent Label Counts - If you are having trouble getting a consistent count it is likely that the sensors are not properly adjusted. 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. Review the section in this manual on proper Counter operation.

Uneven Winding or Telescoping of Labels. If the label web is not properly winding on the take-up reel during operation it is likely that the tension control adjustment is too tight for the roll being counted. Try reducing the tension on the supply reel (left side when counting forward) and recount the roll.

Label web is flapping or loose around the label web guides or rolls are not tightly wound during operation. If this condition exists, it is likely that the tension control adjustment is too weak/loose and tension needs to be increased. Try increasing the tension on the supply reel until the web is tight during the counting process. Recount and rewind the roll with the correct tension.

End-of-Roll error message presented during counting. If you receive an End-Of-Roll error during counting but before the counting operation is complete (the machine will stop and the keypad message will read End-of-roll). Two things can cause this error:

- First check to be sure that the label is passing in the middle of the emitter/detector pair. If the label is very small, or very large it is possible that the light being emitted in the counting station is not being consistently blocked when the label is passing through the counting station. This can happen when the emitter detector pair are adjusted too close to the upper or lower edge of the label. If three labels in a row are not counted, the machine assumes that the counting operation is complete. Try adjusting the sensors up or down to ensure the label is being properly detected by the light beam.
- This error can also occur when the machine is being used with the Constant Speed option ON, and the operator reduces the motor speed abruptly during counting. The slowed timing of the counting operation can give a false End-of-Roll error. Simply turn the motor speed knob OFF and then restart the counting process. The count should be continue to be correct. If operating speed needs to be adjusted during a counting operation it may be best to turn the Constant Speed feature OFF using the keypad.

Preventive Maintenance & Cleaning

Each Scanning Devices label counting table is crafted with durable Stainless Steel for long life and low maintenance. Some routine maintenance and cleaning is required based on usage and individual needs as follows:

- Validate table operations periodically using the PC-based Validation application and a label test roll with a known number of labels. During setup for this test, adjust the sensor sensitivity to insure that the sensor indicator lights travel to both sides of the center guide. Power-up the label table and while "Powering Up" is displayed on the LCD, push and release the reset button on the red faceplate once. The LCD will display "Validation" when the power-up sequence is completed. Start the PC Validation application and follow screen directions. The PC will control the validation and report the results. More detail on Validation is described in Appendix B.
- Tension pads located on the tension arms that provide resistance to the label disks should be checked and replaced periodically. It is recommended that the pads be replaced as a set and once a pad has worn down by 1/4 of an inch +/-. (Scanning Devices part # 30-0180-01). Too much wear on the tension pads will result in the attachment screws that hold the pads in place making contact with the edge of the disk. This will result in unwanted noise or can cause damage to the disks.
- Over time dust or ink from the labels being processed can collect around the counting station and on the surface of the table. It is recommended that periodically the sensor area of the counting station be cleaned by blowing compressed air, vacuuming or using a clean soft brush in and around the sensor brackets. Ink can be removed with Isopropyl Alcohol.
- Wipe all stainless steel parts with lightly dampened cloth or paper towel using Windex® glass cleaner or a spray type stainless steel cleaner. Never spray cleaning fluid onto the machine or its parts directly. Spray cleaner onto cloth or paper towel and then clean surfaces. Do not use water as a cleaner to avoid getting water into electronic systems.
- Brush the keypad clean with a soft brush or vacuum. Do not use chemical cleaners on the rubber keypad.
- Drive belts do not typically need any maintenance or service. Do not attempt to adjust belt tension without first contacting Scanning Devices, Inc.
- Web guides and web guide bearings need no lubrication. The sealed bearings used on these parts require no maintenance.
- Periodically check tension control arms to assure all parts are tight and properly in place. Adjust control arm tension only as needed and as outlined earlier in this manual. The height of the tension arms are set at the factory and should not need to be adjusted. The shaft collars that hold the tension arm in place require a 1/8" Allen wrench. Tension arms should be adjusted so that they tension pad contacts the rotating label disks in the center of the tension pad.
- Periodically check to be sure that the core chucks are securely attached to the ½" disk shaft. If not, use a 3/16" Allen wrench to tighten.
- Calibration – the label counting table makes no absolute measurements. Therefore, no calibration is required. Adjustments for count sensor sensitivity and web speed are operator actions and are be detailed in operating procedures.

Warranty & 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. Telephone support is available at no cost by calling 1-800-323-3347 between the hours of 8:00AM and 5:00PM Easter Time, USA. Label tables that need repair under warranty 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

Contacting Scanning Devices

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

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Mansfield, MA 02048
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Appendix A – Label Count Software

Operating Summary:

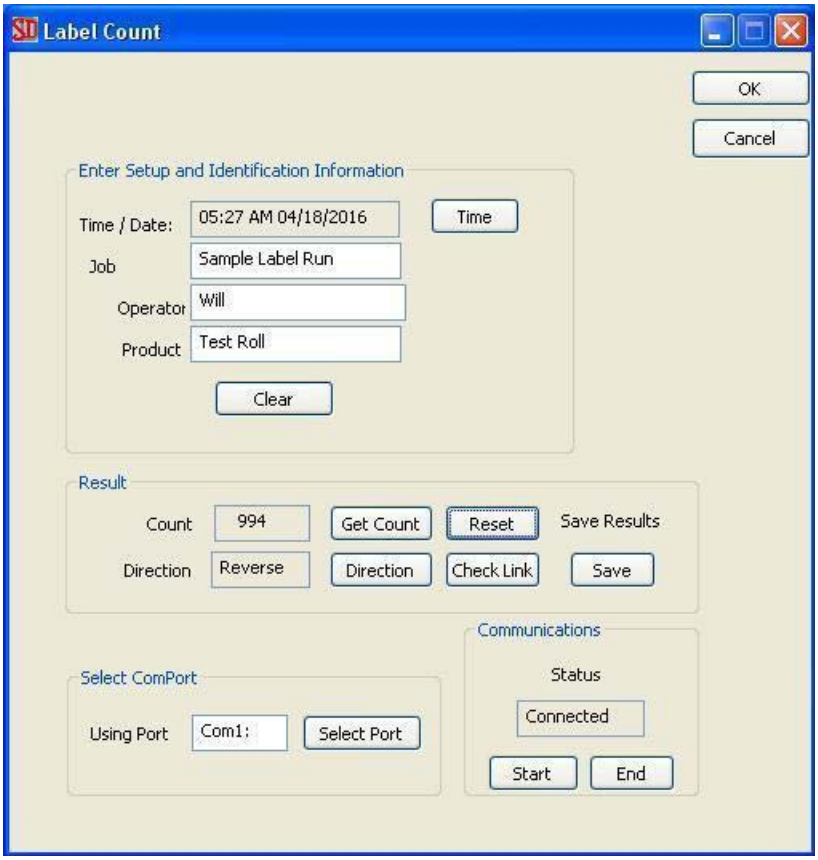
The Scanning Devices Label Count Software allows the user to capture key information about the labels being counted and to save that data to a csv file for record keeping. There are three fields that are populated by the user and three fields that are populated by the software program. In order to use the software the Scanning Devices Label Counter must be configured for connection to a computer by RS232 cable and a cable must be installed.

At the beginning of a counting operation the operator can open the Label Count software and fill in the Job name or number, the name of the Operator, and the Product name or Product number.

At the end of the counting operation the keypad on the Label Counting machine is used to connect the counter to the PC using the "Connect to PC" command (see Label Table Operating Instructions).

From the computer the operator than uses the cursor to select the "Get Count" button on the main software screen. The final label count will populate in the "Count" field using the data collected from the Scanning Devices counter.

The operator then moves the cursor to the "Direction" button on the main software screen. When selected the direction of the count is populated in the "Direction" field. This is most commonly required if organizations demand double counts as part of their process control and wish to validate and document that both Forward and Reverse counts were conducted.



Software Field Definition and Use:

Time/Date - By moving the cursor to the "Time" button, and clicking on that button, the current time and date setting in the connected PC is displayed in the Time/Date field.

Job – This field is used to enter the name or number of the job being counted.

Operator – This field is used to enter the Operator Name or ID number.

Product – This field is used to enter the product name or ID number being counted.

Clear – By moving the cursor to the "Clear" button and clicking on that button the three job related fields can be cleared and re-entered.

Get Count - By moving the cursor to the "Get Count" button, and clicking on that button, the current count displayed on the Scanning Devices Label Table Counter will be pulled into the Label Count Software.

Direction - By moving the cursor to the "Direction" button, and clicking on that button, the direction of the current counting operation will be pulled from the Scanning Devices Label Counter and will populate the "Direction" field.

Reset - By moving the cursor to the "Reset" button, and clicking on that button, the computer will reset the counter on the Scanning Devices Label Counting Table to 0. Once the counter is reset there is no way to recover the count data.

Check Link - By moving the cursor to the "Check Link" button, and clicking on that button it will force the computer to check the active link between the Scanning Devices Label Counter and the Computer. If the link has been properly established a secondary window will open to confirm the link, otherwise a window will open and indicate "No Response from the Label Counter". If this message is received, check that the Label Table Keypad displays "Connected to PC", that a PC Link Cable is properly connected to the back of the Keypad enclosure and to the computer. Also check that the correct Com Port has been selected.

Save - By moving the cursor to the "Save" button, and clicking on that button a secondary window opens and allows the user to save the current data to a CSV file format on the computer. The CSV file may be opened,edited with additional information and printed with Microsoft Excel or equivalent spreadsheet program.

Select Port - By moving the cursor to the "Select Port" button, and clicking on that button the user can select the appropriate Com Port on the computer which is being used to connect the PC to the Label Counting Machine.

Communications – This section of the computer software screen displays the current connection or "Not Connected" status. Use the Start and End buttons to re-establish a link between the counter and the computer, or the End button to end the communications link.

Appendix B – Label Validation Software

Operating Summary:

Scanning Devices Label Validation Software is designed to provide a structured process for validating the Scanning Devices Label Counting Machine. Using a connected PC and a Scanning Devices Certified Label Test Roll (Part Number 08-0796-19) computer commands control critical steps in the validation process helping to eliminate human error. Once complete, count and validation data can be saved and exported as a csv file.

The user begins by loading the Scanning Devices Certified Test Roll onto the Label Counting Machine's left side disk, ensuring that the web is properly fed around the web guides and through the counting station and then wrapped and secured around the take-up core on the right side of the machine.

The Scanning Devices Label Counting Table should be connected to the computer by the supplier RS232 cable. The connected computer should be turned on and the Label Validation Software package open.

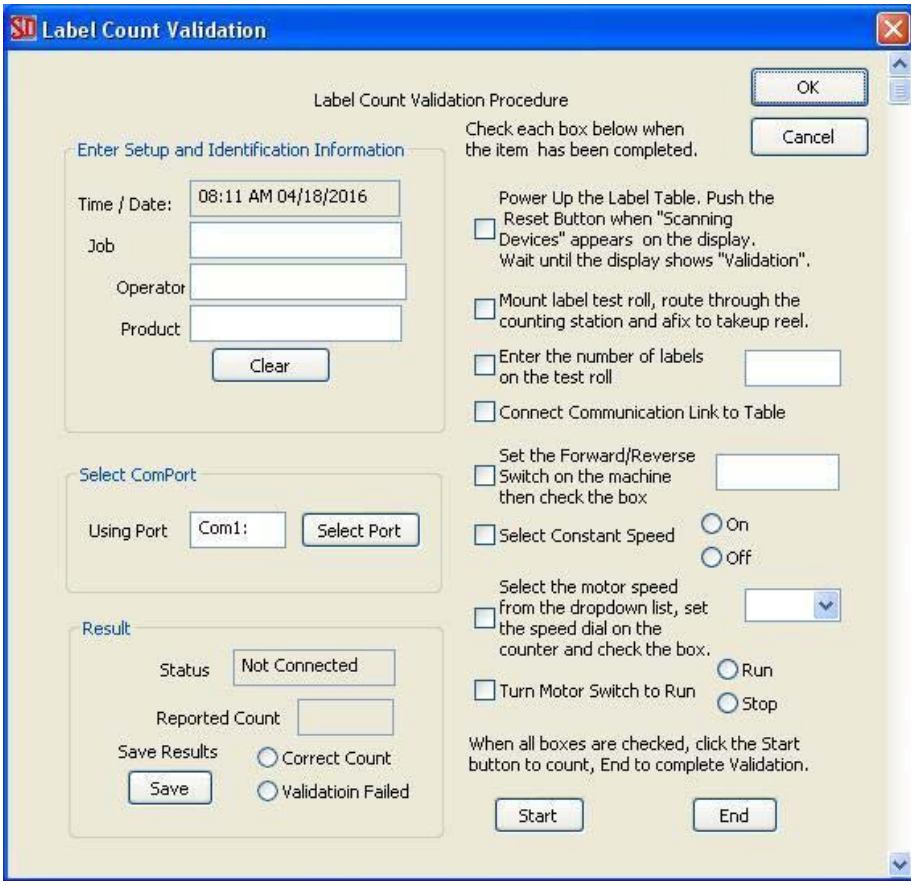
The user then enters the Setup and Identification information including the Job Name or Number, Operator Name, and Product Name or Number. Once that is complete the User follows the instruction on the right side of the screen, step-by-step.

Once all the steps on the screen are completed, the user selects START and the Label Counting Table automatically counts the label roll on the machine and confirms that the Label Table counted the correct number of labels on the roll and the machine is properly validated.

One critical step of the process is that the user enters the number of labels on the Certified Test Roll (i.e. the number of labels expected to be counted). This is later compared to the number of labels that the machine actually counts, compares the two data points and confirms validation or reports a validation error.

The results of the validation process can be saved and exported as a csv file for record keeping.

See Screen Capture of Label Count Validation Software Screen – Next Page



Software Field Definition and Use:

Time/Date - By moving the cursor to the "Time" button, and clicking on that button, the current time and date setting in the connected PC is displayed in the Time/Date field.

Job – This field is used to enter the name or number of the job being counted. This will typically be a job title like "Validation"

Operator – This field is used to enter the Operator Name or ID number.

Product – This field is used to enter the product name or ID number being counted.

Clear – By moving the cursor to the "Clear" button and clicking on that button the three job related fields can be cleared and re-entered.

Select Port - By moving the cursor to the "Select Port" button, and clicking on that button the user can select the appropriate Com Port on the computer which is being used to connect the PC to the Label Counting Machine.

Step-By-Step Validation Process
The user will follow the Step-by-Step process, checking each box as they progress through the steps.

Power Up – The Scanning Devices Label Table must be powered up and the "Reset" button pressed to put the Label Table in "Validating" mode.

Mount Label Test Roll - The user begins by loading the Scanning Devices Certified Test Roll onto the Label Counting Machine's left side disk, ensuring that the web is properly fed around the web guides and through the counting station and then wrapped and secured around the take-up core on the right side of the machine.

Enter Number of Labels – The user enters 1000 if using the Certified Test Roll from Scanning Devices, Inc. Otherwise they enter the number of labels on an alternative test roll that has been validated.

Connect Communication Link to Table – The user ensures that the PC Connection Cable supplied with the Scanning Devices Label Table is connected properly to the back of the keypad enclosure on the Label Counting Table and to the selected com port on the local computer running the Scanning Devices Validation Software.

Select Forward/Reverse Switch – The user sets the selection switch on the front of the Label Counting Table to either the forward, or reverse, direction setting as needed to properly proceed through the counting process. Upon checking this box in the software package the set direction of counting is listed in software.

Select Constant Speed – The user checks either Constant Speed ON or OFF. Either setting will perform properly. No action is needed at the Label Counting Table.

Select Motor Speed – The user selects an appropriate motor speed for the counting process on the front of the Label Counting Table Control Panel and then enters this selected speed in software using the dropdown list.

Turn Motor Switch to RUN – If the switch is not in the Run position, the user moves the Run/Stop Switch on the lower control box of the Label Counting Table to the "RUN" position and then clicks the Run box in Software.

Start – Once all these steps are completed the user presses "Start" button in the Validation Software Screen and the Label Counting Table begins the counting and validation process. The machine runs until the end of roll is detected, stops and automatically transfers the result to the PC

Validation Results

The "Result" section of the software screen shows the results of the Validation Process.

Status – This section will display "Connected" or "Not Connected" to confirm that a valid connection was made between the Label Counting Table and the local computer.

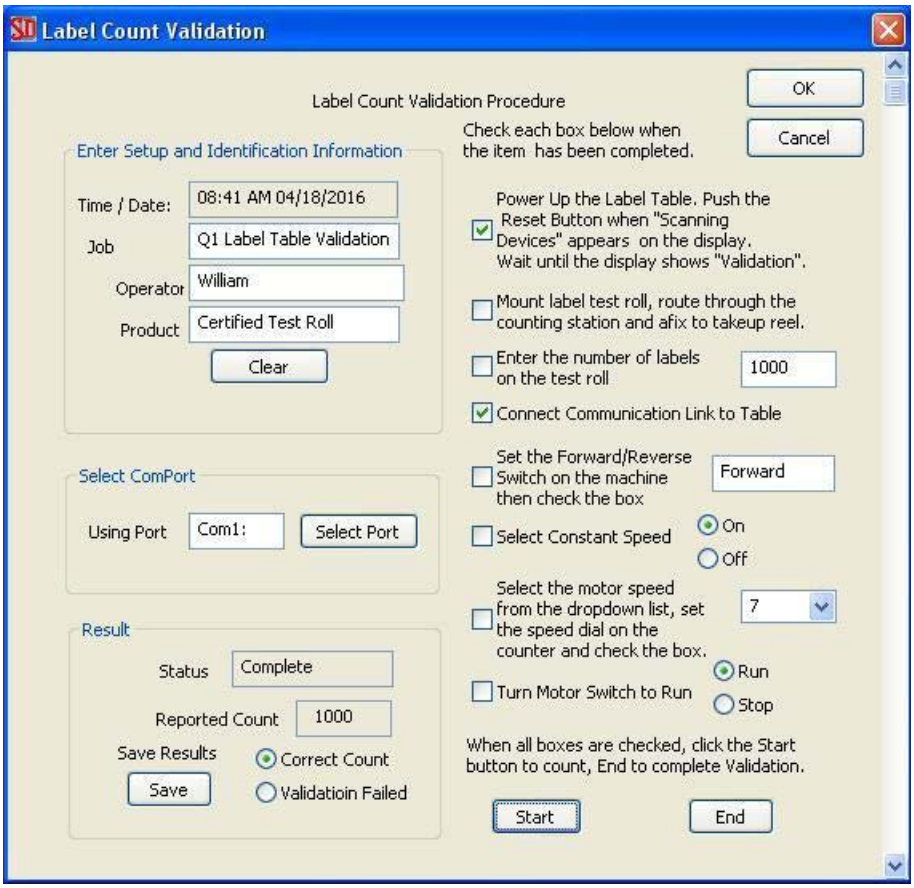
Reported Count – In this field the computer will report the actual count that was reported by the Label Counting Table. This field is compared to the earlier field completed by the operator in the step-by-step portion of the process.

Correct Count – If the computer validates that the counts the user entered and the computer counted match than the validation is considered successful and the screen will report "Correct Count".

Validation Failed – If the computer sees a discrepancy between the count reported by the Label Counting Machine and the count expected by the operator in the step-by-step process, the computer will report "Validation Failed".

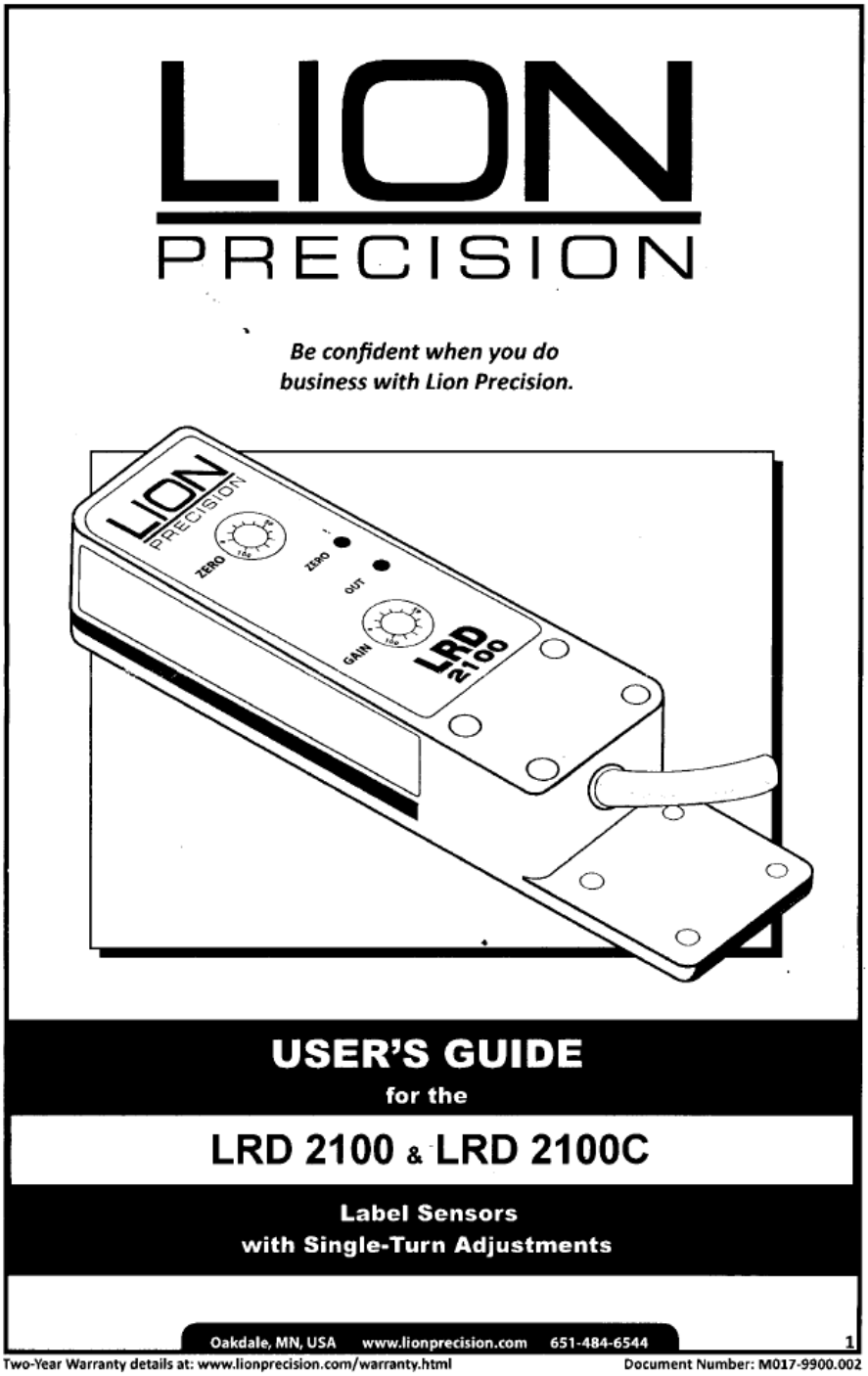
Save – The results of the Validation Process can be saved by pressing the Save button in software. A screen will open asking the user to save the file to an appropriate location on the local computer is a format that may be opened by Microsoft Excel..

Example Screen – Successful Validation



Appendix C – Clear Label Sensor Adjustment

Follow the instructions provided by the manufacturer of the Lion Precision LRD2100 or LRC8200 Sensor to make adjustments to sensitivity:



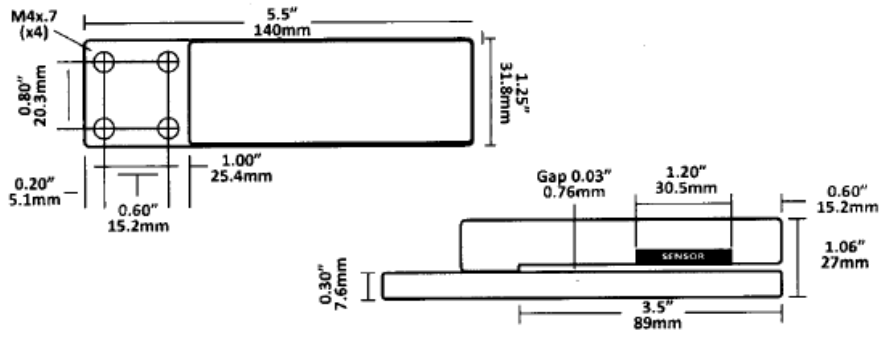
Warnings

Sensor body is connected to Ground. Sensors must not be attached to voltages in excess of 30VRMS or 60VDC.
Use of the equipment in any other manner may impair the safety and EMI protections of the equipment.
All power must be off when installing the sensor.

Specifications

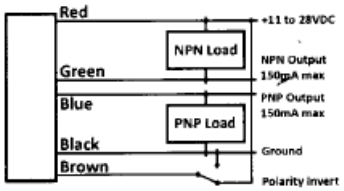
Power Supply	Voltage	11-28 V ⎓ (reverse polarity protected)
	Current	50mA
Response time	on or off	20µs Max
	Switching Frequency	10kHz Max
Output	Output Current (sinking or sourcing)	150mA Max (overload protected)
	Switching Output	PNP (sourcing) or NPN (sinking) w/ Dark or light switching
Temperature	Operating Range	40°F -140°F (4°C - 60°C)
Protections	Supply	Inverse polarity protection
	Switching Output	Short circuit and overload protection

Dimensions



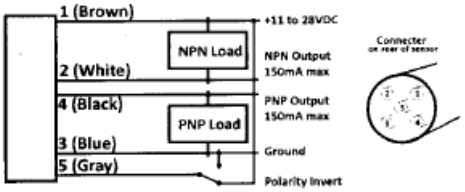
LRD 2100 Wiring

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	



LRD 2100C 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:	Brown wire must be connected to +V or Ground for reliable operation	

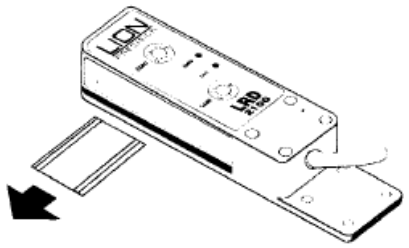


Adjusting the LRD 2100

The adjustments on the LRD 2100 are marked maximum as '100' and the minimum is marked as '0'.
Turning the adjustments past the maximum and or minimum will result in damage to the sensor.
Adjustments when first installed on a machine are seen below.

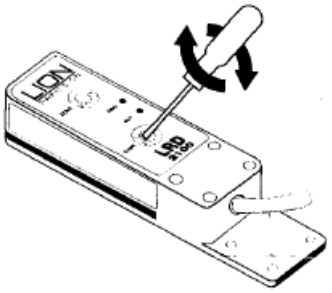
Step 1

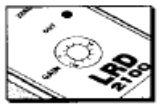
Remove all material from sensor



Step 2

Set GAIN to middle (50)

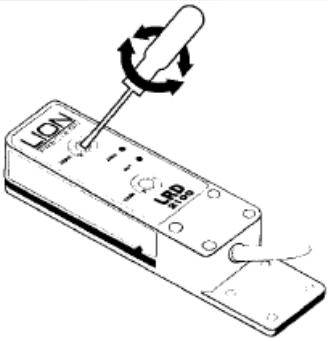


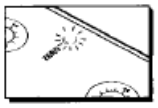


Step 3

Set ZERO

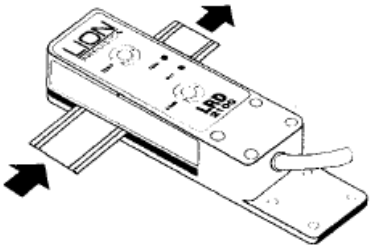
Turn the ZERO adjustment to where the ZERO light changes between on and off. It is not important whether it is on or off when complete, as long as it is close to where it changes

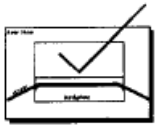




Step 4

Add label material to sensor





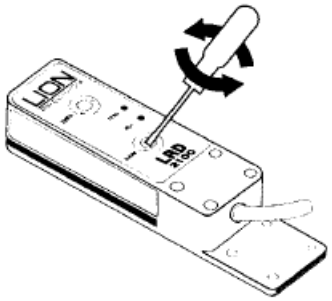
Adjustments when Label Stock Is Changed

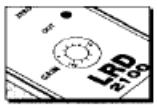
Usually None. The basic setting on the previous page (Gain at Midpoint) will work for most labels. Very small labels may require an increase in Gain.
If, and ONLY IF, the new labels aren't being detected correctly, use this procedure.

Step 1

Set GAIN to minimum (0)

Turn the GAIN button counterclockwise until it points to 0.

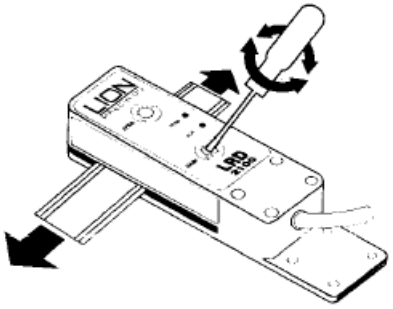


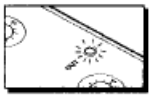


Step 2

Adjust GAIN

Move labels through the sensor and increase GAIN until the OUT light just begins to flash as the gap moves through the sensor. Then, turn the dial one addictional tick mark. Create some slack in the web and move one gap back and forththrough the sensor while adjusting.





Step 3

No label detected

If the sensor does not detect labels reliably, you may have label materials that require an LRD6300 or LRD8200. Contact your Lion Precision sales representative for more information.

Output and Mechanical Detail

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