PRINTRONIX®

Data Validator User's Manual

The Printronix T5000 Series of Label Printers

The Printronix T5000 Series of Thermal Printers

Data Validator User's Manual

PRINTRONIX®

170895-001C

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Overview

The data validator is an external device attached near the paper exit of the printer. Once activated, it scans the printed output, looking for bar codes. When the validator finds a bar code, it determines what type of bar code it is and monitors the bar code quality as it passes through the scan area. After the bar code passes the scan beam, the validator grades the bar code and sends a report to the printer. How the printer responds is determined by the validator settings, explained in “Configuring the Validator” on page 30.

- The validator can track the performance of up to four horizontal linear bar codes or one PDF 417 bar code on one line. (Vertical bar codes are not scanned.)
- The validator requires a minimum distance of 1/2 inch or 20 times the minimum element width (x-dimension) between barcodes, whichever distance is greater.
- The validator only recognizes the following linear, picket fence bar codes: Codabar, Code 39, Code 93, Code 128, Interleaved 2 of 5, and UPC/EAN + add-ons. The validator can only evaluate the PDF 417 bar codes.
- For PDF 417 Limited, the validator works best with security level 5 or higher, using the current default printer settings for Deflects Percentage, Percent Decode, and Decodeability. For

lower security levels, you must lower the Deflects Percentage to 5% to enable checking for bar code damage.

Refer to Table 1 for the minimum x-dimension requirements for each printer size.

Table 1: Minimum X-Dimension and Beam Width for 300 dpi Printer

Printer Size	Beam Width	Minimum X-Dimension
4 inch	4.5 inches	6.6 mils
6 inch	6.5 inches	10 mils
8 inch	8.5 inches	13 mils

Tools And Materials You Will Need

- Static Wrist Strap
- 3mm Allen Key
- 2.5mm Allen Key
- Printer *User's Manual*

Parts List

- Validator and Upper Bracket Assembly
- Cable Assembly
- Lower Bracket Assembly
- Overlays

Safety Notices

WARNING Using controls, making adjustments, or performing procedures other than those specified herein may result in hazardous radiation exposure.

WARNING Class 2 laser light. Do not stare into the laser beam or a reflected image of the laser beam.

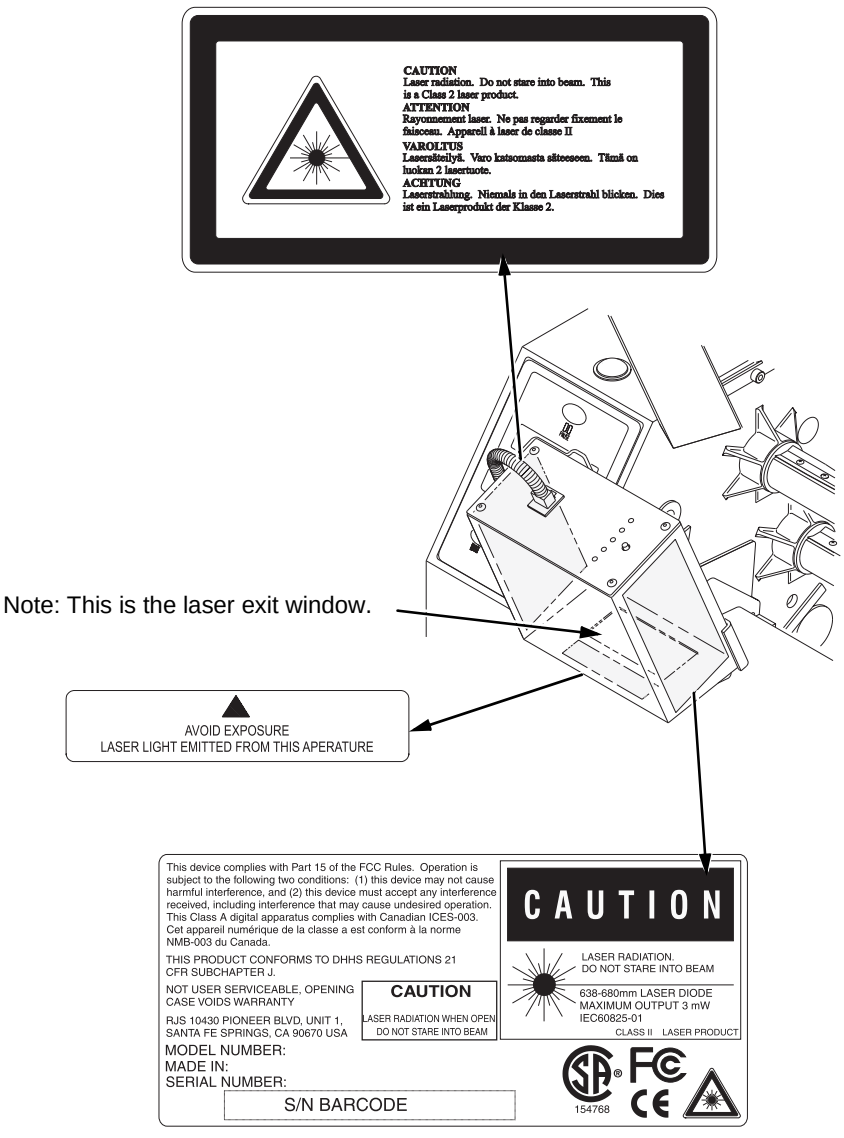


Figure 1. Safety Warnings

Installation

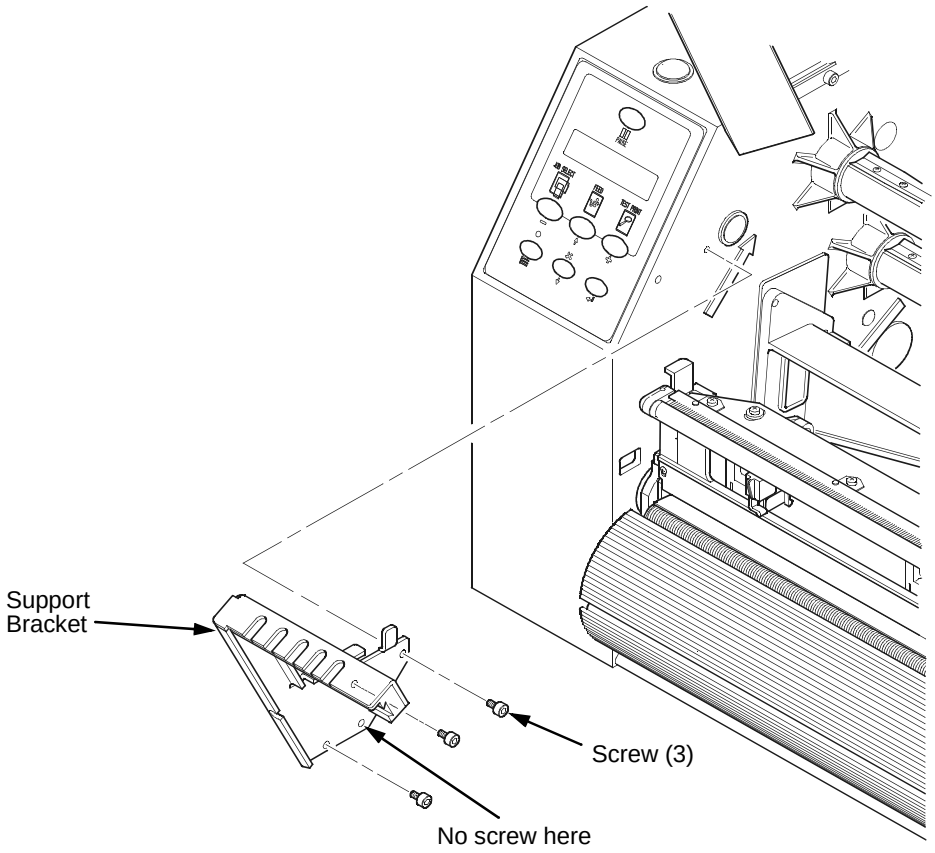


Figure 2. Installing the Support Bracket

1. Remove the validator, the support bracket, and the power/data cable from the packaging.
2. Make sure the printer is off, and unplug the printer from its power source.
3. Raise the media cover.

4. Using the three screws and Allen Key provided, install the support bracket, as shown in Figure 2.

NOTE: Use the three screws to install the support bracket, as shown in Figure 2. (Figure 3 shows the bracket in place.) The screw heads can prevent complete opening of the printhead on some models if the support bracket is not installed as shown.

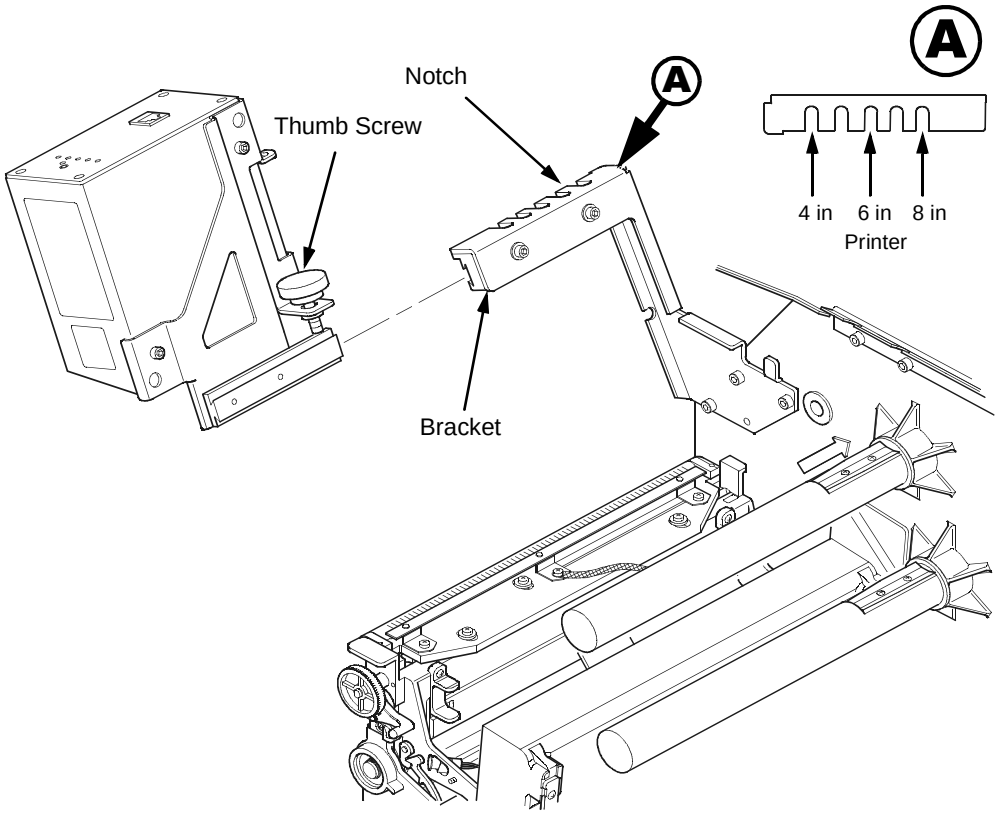


Figure 3. Attaching the Validator to the Support Bracket

5. Face the front of the printer while installing the validator.
6. Loosen the thumb screw on the side of the validator. Slide the validator unit onto the bracket. Refer to Detail A for location of the validator notch for each printer model size.

7. When the unit is positioned correctly, tighten the thumb screw to lock the unit onto the proper notch on the lower bracket.

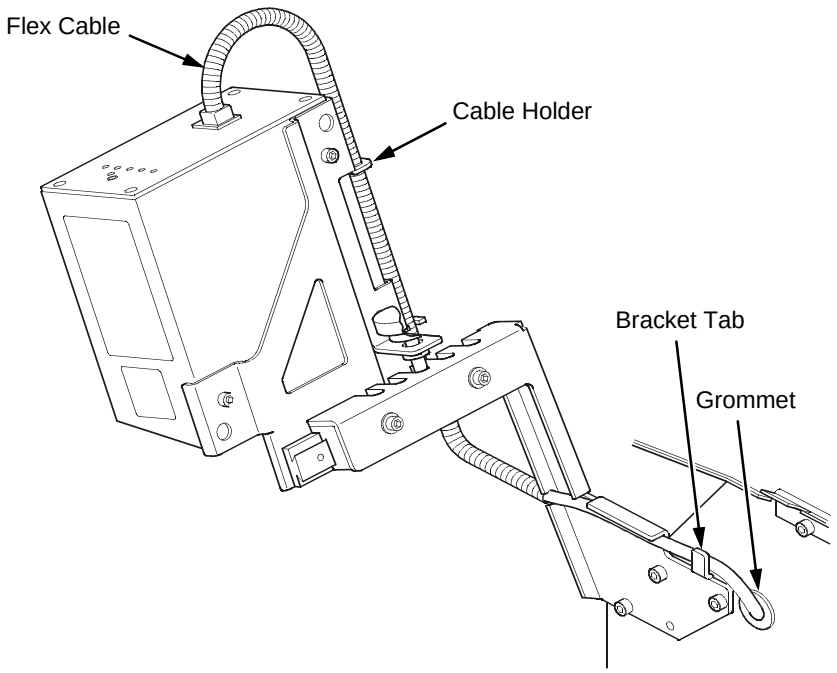


Figure 4. Attaching the Power/Data Cable

8. Attach the flex cable end of the power/data cable to the validator unit.
9. Attach the flat cable end of the power/data cable to the two cable holders on the side of the validator.
10. Insert the grommet into the hole in the printer frame.
11. Route the flex cable through the appropriate cutouts and feed it through the grommet, as shown in Figure 4. When the printer is ordered from the factory with the validator option, the cable is already installed and this step can be skipped.

NOTE: If necessary, loosen the bracket mounting screws enough to slip the power/data cable behind the bracket tab, then retighten the bracket screws.

12. Lower the media cover.

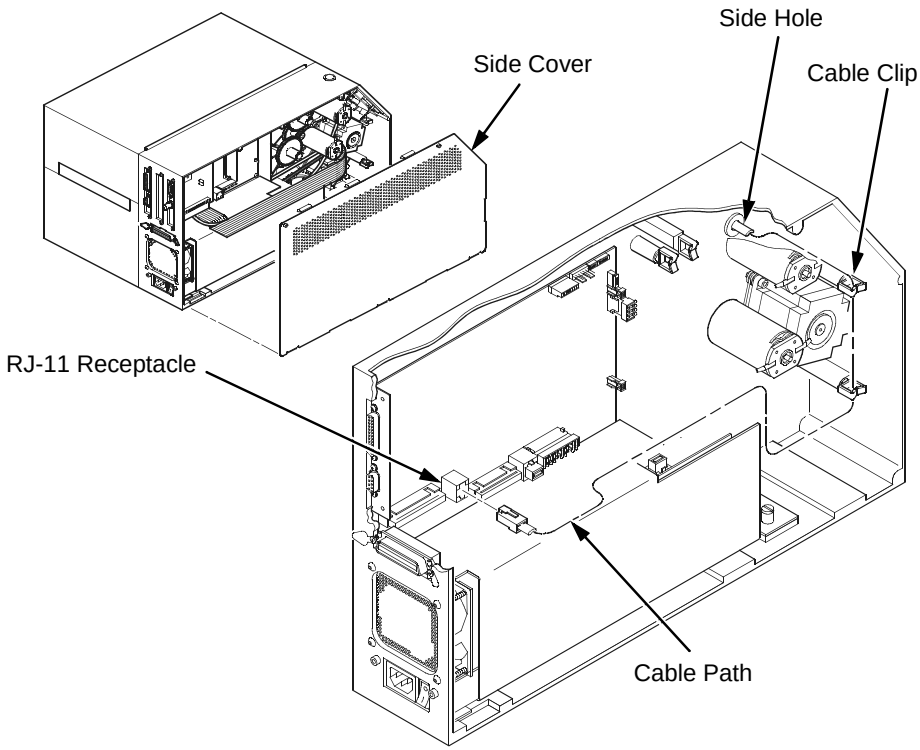


Figure 5. Connecting the Validator

NOTE: Do the following steps only if the field kit was purchased. The following steps must be done by a qualified electronic technician.

13. Remove the side cover.
14. Run the cable through side hole and cable clips.
15. If necessary, remove the CT board. (Refer to the printer *Maintenance Manual*.)
16. Plug the cable into the RJ-11 receptacle.
17. Replace the side cover.

Adjusting The Validator Beam

When the validator is first installed, the visible scannig beam may need to be aligned with the two notches on the sides of the tear bar, as shown in Detail A of Figure 6. When the visible scanning beam is properly aligned it will line up with the two notches. If your printer has a cutter installed, align the beam with the notches at each side of the opening on the hinged upper lid.

NOTE: This adjustment is only possible with the newer version of the upper bracket assembly, which has a thumbscrew.

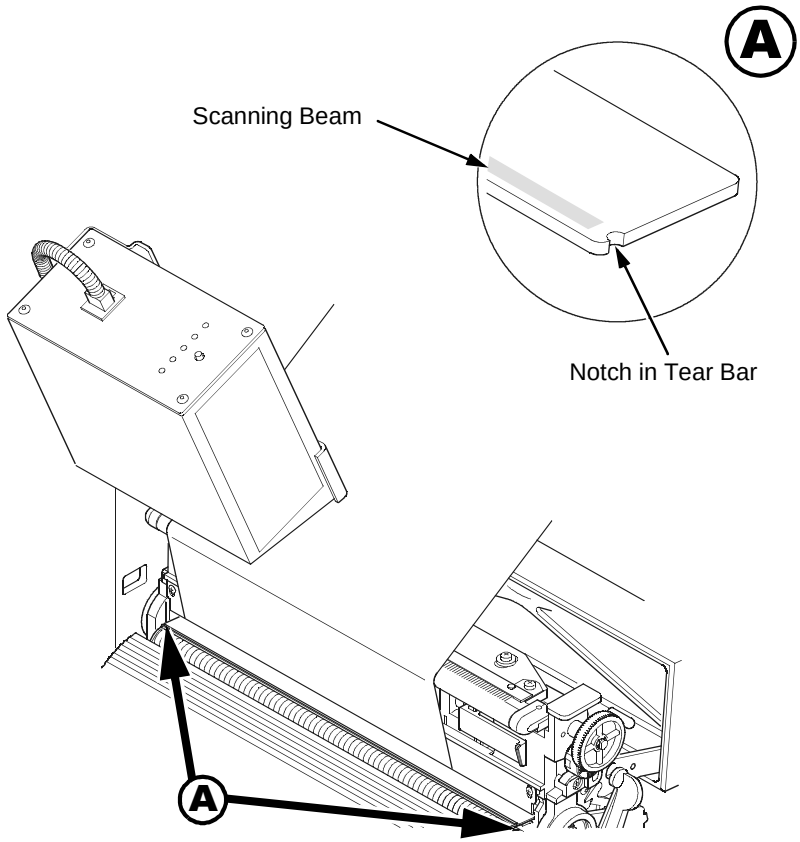


Figure 6. Adjusting Validator Beam

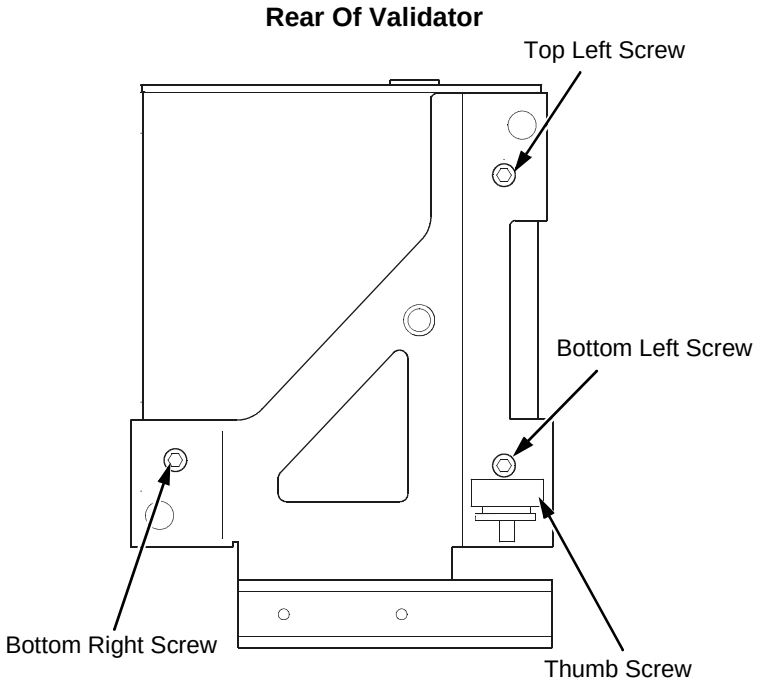
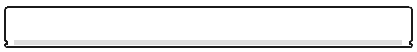


Figure 7. Adjustment Screws

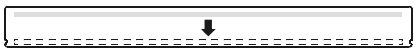
Figure 7 shows the screws used to adjust the parallelism and position of the validator beam. The positions of the screws assume you are behind the validator unit and facing the printer. The following illustrations show how to adjust the validator according to how the beam appears.

1. Power the printer on and make sure the validator beam is on. If the validator beam is off, press the RESET button for less than two seconds to turn on the scanning beam.
2. Use the Allen key provided to adjust the screws.

NOTE: You may have to loosen all three screws and allow the rubber spacers to expand (relax) before making any adjustments.



Correct alignment of the validator beam. The beam should line up with the two notches and be parallel to the tear bar outside edge.



Tighten the top left screw to pivot the beam downward. If already tight, loosen both bottom screws to lower the validator beam.

Tighten both bottom screws to raise the beam. If already tight, try loosening the top left screw to pivot the beam upward.

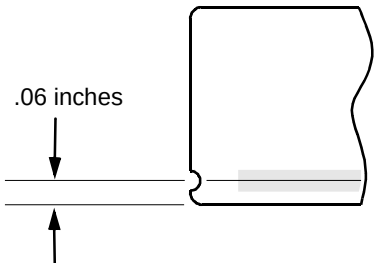
Loosen the bottom right screw to rotate the beam clockwise. If already loose, try tightening the bottom left screw.

Loosen the bottom left screw to rotate the beam counter-clockwise. If already loose, try tightening the bottom right screw.

Summary Of Beam Adjustment

To Move Beam Up	To Move Beam Down	To Rotate Beam Clockwise	To Rotate Beam Counterclockwise
Tighten top left screw or Loosen both bottom screws	Loosen top left screw or Tighten both bottom screws	Tighten bottom left screw or Loosen bottom right screw	Tighten bottom right screw or Loosen bottom left screw

NOTE: Your printer may not have a tear bar with the notch on the ends. Adjust the beam so that the center of the beam is approximately .06 inches from the edge as shown.



Enabling And Disabling The Validator

Enabling and disabling the validator is done through the printer configuration menu.

1. The printer must be in offline mode. If the printer is online, press the PAUSE key to take the printer offline.
2. If the ↵ key is locked, unlock it by pressing ↓ and ↵ together. (This key combination may be set to two different keys.
3. Press ⋮☰ to enter the printer menu. Continue to press ⋮☰ until “VALIDATOR” appears on the printer display.
4. Press ↓ until “Validator Funct.” appears on the printer display.

5. Press + or - until the “Enable” option appears on the printer display.
6. Press ↵ to disable the validator. The printer does not command the validator to begin scanning and no errors are reported. The counters are not incremented while the validator is disabled.
7. Relock by pressing ↓ and ↵ together, then press PAUSE to put the printer back online.

NOTE: To disable the validator once it’s been enabled, repeat the steps above and select the “Disable” option in step 5.

Shifting The Scanner Beam

This is an advanced operation and is only visible if the Advanced menus are shown. Refer to "Configuring the Printer" for information on hiding/showing menu options.

This option enables you to shift the beam horizontally to the left or right. The left edge of the beam should be 0.13 inch to the left of the left edge of the tear bar. After you set this value, save it as part of the configuration for future use.

The value range is from -99 to 99. The default setting is 0. The lower value will move the beam to the left.↓↵

1. The printer must be in offline mode. If the printer is online, press the PAUSE key to take the printer offline.
2. If the ↵ key is locked, unlock it by pressing ↓ and ENTER keys together.
3. Press ⋮☰ to enter the printer menu. Continue to press ⋮☰ until "VALIDATOR" appears on the printer display.
4. Press ↓ until “Validator Funct.” appears on the printer.
5. Make sure the “Enable” option is selected.
6. Press ↓ until "Beam Shift" appears on the printer display.
7. Press + or - scroll through the values: -99 to 99. Default is 0. Press Enter to accept the shift value. Lower value will shift to the left.
8. Keep selecting the new value until the beam width is at the desired position. The left edge of beam should be approximately 0.13 inch from the left of the left edge of the tear bar.
9. Make sure to save the configuration and recycle power to ensure the setting for future use.

NOTE: This shifting procedure needs to be done to the replacement unit.

Calibration

WARNING Using controls, making adjustments, or performing procedures other than those specified herein may result in hazardous radiation exposure.

WARNING Class 2 laser light. Do not stare into the laser beam or a reflected image of the laser beam.

The validator must be calibrated before it can be used. A special calibration bar code is included with the validator package.

1. Make sure the printer is on and the validator beam is on. If the validator beam is off, press the RESET button for less than two seconds to turn on the beam.

Time Reset Button Is Depressed	Result
Less than 2 seconds	Turns on laser beam
More than 4 but less than 6 seconds	Validator goes into calibration mode

2. Raise the media cover. Open the printhead assembly by rotating the release lever clockwise to the end of its travel. The printhead assembly will pop open.
3. If the printer has the cutter option, put the cutter in the open (down) position.
4. Remove the calibration bar code card from its protective sleeve and slide it into the open printhead and under the scanning beam.
5. Make sure the bar code is under the beam and the READ LED light is on.

6. Press and hold the RESET button on the validator until the CALIBRATION light begins flashing.

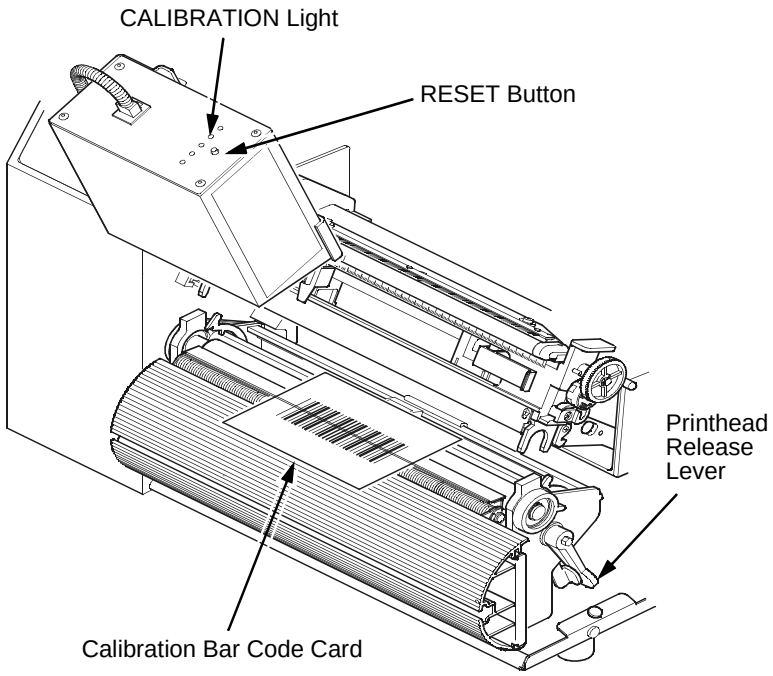


Figure 8. Opening the Printhead Assembly

7. The scanning beam should turn off for few seconds then back on and the CALIBRATION light should turn off. This indicates a successful calibration.
8. Remove the calibration bar code card. Close the printhead and rotate the release lever counterclockwise to the end of its travel. Close the printer cover.
9. If the calibration was successful, the scanning beam is on and the CALIBRATION light is off.

   If the calibration was not successful, the beam remains on and the CALIBRATION light stays lit without flashing. Repeat the calibration procedure. If repeated attempts fail, check the

ambient light conditions (see “Ambient Light Fault” in the printer *User’s Manual*).

NOTE: In some cases the validator can detect and indicate to the printer that calibration is required. Refer to “Calibration Warning” in the *User’s Manual* for details.

Bar Code Validation Demo Page

This demo page allows you to test or demonstrate the validator operation without a host computer. The demo page contains some text and two good bar code symbologies: one is in Code 39 and other is in Code 128.

To print and validate the bar code validation demo page:

1. Load the factory default configuration.
2. Make sure the validator is enabled.
3. In the Media Control menu, set Gap Sensing to Transmissive.
4. Load the standard label size, or continous labels, for the printer you are working on. Standard label sizes are:

   Four inch printer: 4 x 6 inch labels

   Six inch printer: 6.5 x 4 inch labels

   Eight inch printer: 8.5 x 6 inch labels
5. Calibrate the printer for proper gap sensing.
6. The printer must be in offline mode. If the printer is online, press the PAUSE key to take the printer offline.
7. Press the TEST PRINT key to enter the Test Print menu. Continue to press TEST PRINT key until "Barcode Demo" appears on the printer display.

8. Press the ↵ key to print and validate the demo page. (If the ↵ key is locked, unlock it by pressing ↓ and ↵ together. This key combination can be changed by the user. Use the correct key combination if it was changed.)
9. The printer will make three demo pages, and each page contains two good bar codes. To demonstrate the bad bar code reading, block the scanning beam with an opaque object while the bar code moves under the beam. When you block the beam, the validator will generate a reading error and will perform a default error action. The default setting for the "Validator Action" under validator menu is Reprint Form.
10. Print the validation report to ensure the barcodes are validated correctly.
11. Relock by pressing ↓ and ↵ together, then press PAUSE to put the printer back online.

Chapter 1 Calibration

2 *Operation*

Basic Validator Setup

Unit Positioning

The validator must be positioned so the beam properly covers the entire area containing the bar codes, including the area required for quiet zones. The validator can be moved along the support bracket and latched into any of the pre-cut notches, depending on the size of the labels printed and the positioning of the bar codes on those labels. In addition, the beam width can be moved horizontally to the left or right. See “Summary Of Beam Adjustment” on page 19.

If a bar code is completely out of the scanning area, or it straddles an edge, it is interpreted as a missing bar code and generates error conditions.

Validator Front Panel

The front panel on the validator has a number of indicators:

- **Power.** Indicates the validator is at full power.
- **Calibration.** Flashes when the validator needs to be calibrated. See “Calibration” on page 22 for calibration instructions.
- **Read.** Flashes “On” when the validator is reading a bar code.
- **1 and 2.** Used for maintenance purposes only.
- **Reset button.** This button is used in the calibration procedure and possible troubleshooting situations. Except in these specific circumstances, the Reset button should not be used.

Time Reset Button Is Depressed	Result
Less than 2 seconds	Turns on laser beam
More than 4 but less than 6 seconds	Validator goes into calibration mode

CAUTION **Do not lift the printer by the validator unit or by the support bracket.**

CAUTION **The validator contains sensitive electronic equipment. Do not bang or drop the validator unit.**

Validator Menu Structure

VALIDATOR

Validator Report (page 31)
Clear Data (page 31)
Codes Printed (page 34)
Forms Printed (page 34)
Bad Forms (page 34)
Average BWD: (page 34)
Last BWD: (page 34)
Validator Funct. (page 30)
Telemetry Path (page 32)
Telemetry Data (page 33)
Number of Codes (page 35)
Validator Action (page 50)
Symbol Contrast (page 36)
Quiet Zones (page 36)
Decodeability (page 41)
Percent Decode (page 40)
Defects (page 42)
Min. Code Height (page 44)
Form Spacing (page 46)
Skip Labels (page 38)
F/W Revision (page 37)
Overstrike Style (page 38**)**
Scanner Settings (page 43)
Beam Shift (page 43)
I2 of 5 Checksum (page 39)

NOTE: The **BOLD** items are advanced adjustments and only visible if the advanced menus are unhidden. Refer to "Configuring the Printer" in your printer *User's Manual* for information on hiding/unhiding menu options.

Configuring the Validator

Setting validator options is done through the printer configuration menu. The validator comes equipped with a default setting for each configuration option, and it works without having to change any of these options. However, in some cases it is necessary to adjust these options, which are described below.

Enabling and Disabling The Validator

1. The printer must be in offline mode. If the printer is online, press the PAUSE key to take the printer offline.
2. If the ↵ key is locked, unlock it by pressing ↓ and ↵ together. (This key combination may be set to two different keys.
3. Press ⋮☰ to enter the printer menu. Continue to press ⋮☰ until “VALIDATOR” appears on the printer display.
4. Press ↓ until “Validator Funct.” appears on the printer display.
5. Press + or - until the “Enable” option appears on the printer display.
6. Press ↵ to disable the validator. The printer does not command the validator to begin scanning and no errors are reported. The counters are not incremented while the validator is disabled.
7. Relock by pressing ↓ and ↵ together, then press PAUSE to put the printer back online.

NOTE: To disable the validator once it’s been enabled, repeat the steps above and select the “Disable” option in step 5.

Validator Reporting

After any completed print job, you can request a report from the printer which describes the validation statistics since the printer was turned on, or since the last data reset (for information on resetting data, see page 31).

Requesting A Validator Report

This procedure prints a summarized validator report on the printer itself.

1. The printer must be in offline mode. If the printer is online, press the PAUSE key to take the printer offline.
2. If the ↵ key is locked, unlock it by pressing ↓ and ↵ together. (This key combination may be set to two different keys. See “Configuring the Printer” in your *User’s Manual* for details.)
3. Press ⁝☰ to enter the printer menu. Continue to press ⁝☰ until “VALIDATOR” appears on the printer display.
4. Press ↓ until “Validator Report” appears on the printer display.
5. Press ↵ to print the report.
6. Relock by pressing ↓ and ↵ together, then press PAUSE to put the printer back online.

Resetting Validator Data

The validator reports on all bar codes it detects since the last data reset. For example, let’s say you print a large batch of labels with bar codes and then print a validator report. Then you print another batch of labels with bar codes and print another report. The report will contain information on both batch jobs. However, if you reset the validator data between batch jobs, the second report will only contain information on the second batch job.

To reset validator data:

1. The printer must be in offline mode. If the printer is online, press the PAUSE key to take the printer offline.

2. If the ↵ key is locked, unlock it by pressing ↓ and ↵ together. (This key combination may be set to two different keys. See “Configuring the Printer” in your *User’s Manual* for details.)
3. Press ⋮☰ to enter the printer menu. Continue to press ⋮☰ until “VALIDATOR” appears on the printer display.
4. Press ↓ until “Clear Data” appears on the printer display.
5. Press ↵ to clear validator data.
6. Relock by pressing ↓ and ↵ together, then press PAUSE to put the printer back online.

Defining The Data Output Destination (Telemetry Path)

You may want to send a streaming flow of validation data to an external device during the print job. Follow the procedure below to select the data output destination.

1. The printer must be in offline mode. If the printer is online, press the PAUSE key to take the printer offline.
2. If the ↵ key is locked, unlock it by pressing ↓ and ↵ together. (This key combination may be set to two different keys. See See “Configuring the Printer” in your *User’s Manual* for details.)
3. Press ⋮☰ to enter the printer menu. Continue to press ⋮☰ until “VALIDATOR” appears on the printer display.
4. Press ↓ until “Telemetry Path” appears on the printer display.
5. Press + and - to cycle through the choices:
   - **Disabled.** Default setting. The validator does not send any data to an external device.
   - **Serial Port.** The printer outputs the bar code analysis and underlying data from the validator to a device connected to the serial port, so the validator data can be seen and analyzed with validator software on a computer.

- **Network Port.** The printer outputs the bar code analysis and underlying data from the validator to a device connected to the network port so the validator data can be seen and analyzed with the validator software.

6. When your selection is displayed, press ↵ to activate it. All future reports are output to your selection.
7. Relock by pressing ↓ and ↵ together, then press PAUSE to put the printer back online.

Selecting The Type Of Report For the Data Output Destination (Telemetry Data)

By default, the validator sends the Short Report to the selected data output destination, but there are two other report options available: Full and Validation.

1. The printer must be in offline mode. If the printer is online, press the PAUSE key to take the printer offline.
2. If the ↵ key is locked, unlock it by pressing ↓ and ↵ together. (This key combination may be set to two different keys. See "Configuring the Printer" in your *User's Manual* for details.)
3. Press ⋮☰ to enter the printer menu. Continue to press ⋮☰ until "VALIDATOR" appears on the printer display.
4. Press ↓ until "Telemetry Data" appears on the printer display.
5. Press + and - to cycle through the choices:

   - **Short Report.** Default setting. Provides the encoded failure cause or pass indication and the bar width deviation, shown as a percentage.
   - **Full Report.** Provides a completed report of all the data captured by the validator. This report can be fed directly to the analysis software for capture and review.
   - **Validation Mode.** Provides the same data as the Short Report, but adds the actual bar code data read.

6. When your selection is displayed, press ↵ to activate it.

7. Relock by pressing ↓ and ↵ together, then press PAUSE to put the printer back online.

Validator Statistics

The validator displays a number of statistics directly on the printer LCD, without having to print a report. To view any of the statistics:

1. The printer must be in offline mode. If the printer is online, press the PAUSE key to take the printer offline.
2. Press ☰ to enter the printer menu. Continue to press ☰ until "VALIDATOR" appears on the printer display.
3. Press ↓ to scroll through the following statistics on the printer display:

   - **Codes Printed.** The number of bar code reports sent from the validator since the last Clear Data command.
   - **Forms Printed.** The number of forms printed since the last Clear Data command.
   - **Bad Forms.** The number of forms containing a bar code that fell below the minimum acceptable level since the last Clear Data command.
   - **Average BWD.** The average of all Bar Width Deviations reported since the last Clear Data command, shown as a percentage.
   - **Last BWD.** The Bar Width Deviation included in the most recent report received from the validator, shown as a percentage.

NOTE: A bar code's Bar Width Deviation is determined by comparing the bar width the validator expects to the bar width that is actually printed. For example, if the bar width is printed exactly as the validator expects, the BWD is 0%. However, if the bar width as printed is 25% wider or narrower than the validator expects it to be, it reports a BWD of 25%.

4. Press PAUSE to put the printer back online.

Defining Validator Options

A number of validator options which define specific parameters for certain print jobs can be set from the printer configuration menu.

Setting Number Of Bar Codes On A Form

You can define how many bar codes the validator should expect on a form. This setting is required when bar codes are produced as a part of a larger bit mapped image. When set to a specific number, the printer checks after a form has printed and passed the validator and determines if it has received an analysis report for each bar code. If the printer does not have as many reports as it expects, it can assume a gross bar code failure.

When Auto is selected, the printer only expects as many bar code analyses as bar codes printed using printer bar code commands defined by the host software.

1. The printer must be in offline mode. If the printer is online, press the PAUSE key to take the printer offline.
2. If the ↵ key is locked, unlock it by pressing ↓ and ↵ together. (This key combination may be set to two different keys. See “Configuring the Printer” in your *User’s Manual* for details.)
3. Press ⁝☰ to enter the printer menu. Continue to press ⁝☰ until “VALIDATOR” appears on the printer display.
4. Press ↓ until “Number of Codes” appears on the printer display.
5. Press + or - to scroll through the choices: Auto, 1–10. Auto is the default.
6. Press ↵ to select the desired value.
7. Relock by pressing ↓ and ↵ together, then press PAUSE to put the printer back online.

Setting The Symbol Contrast

Symbol contrast represents the contrast between the bars and spaces in the bar code. The bar code must have a certain level of contrast to be recognized by the validator. When the Symbol Contrast parameter is enabled, then the bar code contrast is included as part of the pass/fail criteria.

1. The printer must be in offline mode. If the printer is online, press the PAUSE key to take the printer offline.
2. If the ↵ key is locked, unlock it by pressing ↓ and ↵ together. (This key combination may be set to two different keys. See "Configuring the Printer" in your *User's Manual* for details.)
3. Press ⋮☰ to enter the printer menu. Continue to press ⋮☰ until "VALIDATOR" appears on the printer display.
4. Press ↓ until "Symbol Contrast" appears on the printer display.
5. Press + or - to scroll through the choices: "Enable" or "Disable". Enable is the default.
6. Press ↵ to select the desired value.
7. Relock by pressing ↓ and ↵ together, then press PAUSE to put the printer back online.

Checking Quiet Zones

The quiet zone is the white space surrounding the bar code. Each bar code requires a minimum quiet zone distance in order for the bar code to be scanned properly.

NOTE: The validator requires a minimum distance of 1/2" or 20 times the minimum element width (x-dimension), whichever is greater, between bar codes.

When the Quiet Zone parameter is enabled, then the bar code quiet zone is included as part of the pass/fail criteria.

1. The printer must be in offline mode. If the printer is online, press the PAUSE key to take the printer offline.

2. If the ↵ key is locked, unlock it by pressing ↓ and ↵ together. (This key combination may be set to two different keys. See "Configuring the Printer" in your *User's Manual* for details.)
3. Press ⋮☰ to enter the printer menu. Continue to press ⋮☰ until "VALIDATOR" appears on the printer display.
4. Press ↓ until "Quiet Zone" appears on the printer display.
5. Press + or - to scroll through the choices: "Enable" or "Disable". Enable is the default.
6. Press ↵ to select the desired value.
7. Relock by pressing ↓ and ↵ together, then press PAUSE to put the printer back online.

NOTE: The validator does not recognize x-dimensions greater than 40-mil with Quiet Zone enabled.

Checking the Firmware Revision Number

For troubleshooting purposes, you may need to reference the firmware revision number.

1. The printer must be in offline mode. If the printer is online, press the PAUSE key to take the printer offline.
2. Press ⋮☰ to enter the printer menu. Continue to press ⋮☰ until "VALIDATOR" appears on the printer display.
3. Press ↓ until "F/W Revision" appears on the printer display. The firmware version number is shown.
4. Press PAUSE to put the printer back online.

Setting For Skip Labels

This option is used for skipping blank labels after the bad label has been marked. It is useful when the user wants to have extra blank labels in between bad and good labels. The settings are Minimum (as default) and Maximum. Minimum allows 1 blank. Maximum allows 2 blanks.

NOTE: Minimum and Maximum blank labels are only applicable for labels 2” high or greater. For labels 2” high or less, the minimum and maximum blank labels may vary.

1. The printer must be in offline mode. If the printer is online, press the PAUSE key to take the printer offline.
2. Press ⋮☰ to enter the printer menu. Continue to press ⋮☰ until “VALIDATOR” appears on the printer display.
3. Press ↓ until "Skip Labels” appears on the printer display.
4. Press + or - to scroll through the choices: “Minimum” or “Maximum.” Minimum is default.
5. Press ↵ to select the desired value.
6. Relock by pressing ↓ and ↵ together, then press PAUSE to put the printer back online.

Setting Overstrike Style

This option is used for marking bad labels with different overstrike style. The available overstrike styles are Grid or Grey.

1. The printer must be in offline mode. If the printer is online, press the PAUSE key to take the printer offline.
2. Press ⋮☰ to enter the printer menu. Continue to press ⋮☰ until “VALIDATOR” appears on the printer display.
3. Press ↓ until "Overstrike Style” appears on the printer display.
4. Press + or - to scroll through the choices: “Grid” or “Grey.” Grid is default.
5. Press ↵ to select the desired value.
6. Relock by pressing ↓ and ↵ together, then press PAUSE to put the printer back online.

Setting Interleave 2 of 5 Checksum

This option allows user to include or exclude the checksum option in the Interleave 2 of 5 code as part of the grading. For example, if this option is set as enabled then any incoming barcode data without checksum digits will be graded as failure. There will be an error posted as Checksum Failure from the printer panel.

The settings are disabled (as default) and enabled.

1. The printer must be in offline mode. If the printer is online, press the PAUSE key to take the printer offline.
2. If the ↵ key is locked, unlock it by pressing ↓ and ↵ keys together.
3. Press ⋮☰ to enter the printer menu. Continue to press ⋮☰ until "VALIDATOR" appears on the printer display.
4. Press ↓ until "I2of5 Checksum" appears on the printer display.
5. Press + or - scroll through the options: diabled or enabled. Default is diabled.
6. Press ↵ to accept the desire value.
7. Re-lock the control panel by pressing ↓ and ↵ simultaneously, then press PAUSE to put the printer on-line.

Advanced Validator Options

The following items are considered advanced items and are only visible if the advanced menus are unhidden. Refer to your *User's Manual*, in the section titled "Configuring the Printer' for information on hiding/unhiding menu options.

Percent Decode

You can set how strict the validator grades each bar code. For example, if the Percent Decode value is 60%, this means that 60% of the scanned bar code must be readable for the validator to give the bar code a passing grade. You can set the Percent Decode parameter to a percentage value between 99% and 0%. The higher the percentage value chosen, the stricter the validator grades.

1. The printer must be in offline mode. If the printer is online, press the PAUSE key to take the printer offline.
2. If the ↵ key is locked, unlock it by pressing ↓ and ↵ together. (This key combination may be set to two different keys. See "Configuring the Printer" in your *User's Manual* for details.)
3. Press ⋮☰ to enter the printer menu. Continue to press ⋮☰ until "VALIDATOR" appears on the printer display.
4. Press ↓ until "Percent Decode" appears on the printer display.
5. Press + or - to scroll through the percentage values: 99%, 98%, etc. until 0%. Default is 60%.
6. Press ↵ to select the desired value.
7. Relock by pressing ↓ and ↵ together, then press PAUSE to put the printer back online.

Decodeability

You can set how strict the validator grades the wide/narrow bars and spaces which compose the bar code. For example, if the default Decodeability value is set to 40%, the validator gives the bar code a failing grade. You can set the Decodeability parameter to a percentage value between 90% and 30%. The greater the percentage value chosen, the stricter the validator grades.

1. The printer must be in offline mode. If the printer is online, press the PAUSE key to take the printer offline.
2. If the ↵ key is locked, unlock it by pressing ↓ and ↵ together. (This key combination may be set to two different keys. See “Configuring the Printer” in your *User’s Manual* for details.)
3. Press ⋮☰ to enter the printer menu. Continue to press ⋮☰ until “VALIDATOR” appears on the printer display.
4. Press ↓ until “Decodeability” appears on the printer display.
5. Press + or - to scroll through the percentage values: 90%, 89%, etc. until 30%. Default is 40%.Press ↵ to select the desired value.
6. Relock by pressing ↓ and ↵ together, then press PAUSE to put the printer back online.

Defects

You can set how strict the validator grades the irregularities such as voids and spots found within elements and quiet zone for each bar code. For example, the default Defects value is 20%. This means that if the bar code and quiet zone defects exceeds 20%, the validator gives bar code a failing grade. You can set the Defects parameter to a percentage value between 100% and 0%. The lower the percentage value chosen, the stricter the validator grades.

1. The printer must be in offline mode. If the printer is online, press the PAUSE key to take the printer offline.
2. If the ↵ is locked, unlock it by pressing ↓ and ↵ together. (This key combination may be set to two different keys. See “Configuring the Printer” for details.)
3. Press ⋮☰ to enter the printer menu. Continue to press until “VALIDATOR” appears on the printer display.
4. Press ↓ until “Defects” appears on the printer display.
5. Press + or - to scroll through the percentage values: 100%, 99%, etc. until 0%. Default is 20%.
6. Press ↵ to select the desired value.
7. Relock by pressing ↓ and ↵ together, then press PAUSE to put the printer back online.

Scanner Setting

This option has two purposes:

1. Allows the validator to upload an optimized setting for a particular printer size at power up. This will use the full scanner beam width and improve the performance and efficiency of the validator.
2. Allows you to customize a special scanner setting for a specific application. This can be achieved in conjunction with Printronix to obtain a special setting file. The file can the be downloaded to the printer by using normal printer download modes, and must be saved as part of the power up configuration. For more information, contact the Printronix Customer Solutions Center at 714-368-2686.

To set this option with a special setting has been downloaded:

1. The printer must be in offline mode. If the printer is online, press the PAUSE key to take the printer offline.
2. If the ↵ key is locked, unlock it by pressing the ↓ and ↵ keys together.
3. Press ⁝☰ to enter the printer menu. Continue to press ⁝☰ until "VALIDATOR" appears on the printer display.
4. Press ↓ until "Scanner Setting" appears on the printer display.
5. Press + or - scroll through the options: Printronix Default or special file name. Printronix Default seting is default.
6. Press ↵ to accept the special setting option.
7. Save this configuration and set as power up configuration.
8. Recycle power for the new setting takes into effect.
9. The beam may need to be moved horizontally. This can be done by using "Beam Shift" menu.

Setting Beam Shift

See “Shifting The Scanner Beam” on page 21 for details.

Operation

There are a number of factors which contribute to successful bar code validation, including printer speed, demand print settings, calibration, and ambient light. The following sections describe how to ensure your bar code validator is scanning and reporting properly.

Print Speed Limits

Two factors in the validation process affect the printer's speed limit: bar code height and the validation report type selected.

Bar Code Height (Min. Code Height)

The validator cannot function at the highest speed possible by the printer. It requires a minimum number of scans per bar code to make a reliable assessment, so the speed of the printer is limited by the height of the bar code. If the bar code is very short, printing needs to be slowed down to allow sufficient scans to occur. If the print speed exceeds this limit, the message, "Speed Exceeds Validator Limit" will appear. Print speed will be lowered automatically if required, but will not automatically reset to a higher speed.

The printer cannot predict how high all the bar codes in a given job will be, so it cannot automatically limit or adjust the print speed to insure the code height/speed requirement is being met. When the bar code is too short for the selected speed, the printer produces a missing bar code error condition. Therefore, printer speed must be set manually to compensate for bar code height.

Use this formula to determine printer speed in relation to bar code height:

$$\frac{\text{Bar Code Height In Inches}}{0.04} = \text{Maximum Printer Speed In Inches Per Second}$$

For example, a bar code 1” in height can scan successfully at a printer speed of 25 inches per second; a bar code 1/8” in height can scan successfully at no more than 3 inches per second.

By changing the Min. Code Height, the printer and slew speeds will be changed automatically.

To change the Min. Code Height:

1. The printer must be in offline mode. If the printer is online, press the PAUSE key to take the printer offline.
2. Press ⋮☰ to enter the printer menu. Continue to press ⋮☰ until “VALIDATOR” appears on the printer display.
3. Press ↓ until "Min. Code Height” appears on the printer display.
4. Press + or - to scroll through the choices: 0.40, 0.32, 0.25, 0.20, 0.16 and 0.13. Default.is 0.40.
5. Press ↵ to select the desired value. The printing and slew speeds will be changed after ↵ is pressed.
6. Relock by pressing ↓ and ↵ together, then press PAUSE to put the printer back online.

To set the printer speed manually:

1. The printer must be in offline mode. If the printer is online, press the PAUSE key to take the printer offline.
2. If the ↵ key is locked, unlock it by pressing ↓ and ↵ together. (This key combination may be set to two different keys. See “Configuring the Printer” in your *User’s Manual* for details.)
3. Press ⋮☰ to enter the printer menu. Continue to press ⋮☰ until “MEDIA CONTROL” appears on the printer display.
4. Press ↓ until “Print Speed” appears on the printer display.
5. Press + or - to scroll through the choices. See “Configuring the Printer” in your *User’s Manual* for details.

6. Press ↵ to select the desired value.
7. Relock by pressing ↓ and ↵ together, then press PAUSE to put the printer back online.

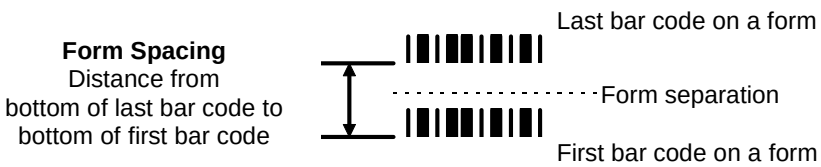
Validation Report Type

Another factor that limits print speed is the type of validation report selected. The printer automatically examines the selected report type and sets the defined maximum slew (vertical paper movement) and print speeds to insure proper operation. If the current speed selected in the menus is higher than the maximum, the value is changed to equal the maximum. If the current menu setting is lower than the newly set maximum, no change in speed occurs. The limits are detailed in Table 2.

Table 2. Print Speed Limits By Report Type

Report Type Selected	Maximum Print Speed
Short Report	6 inches per second
Full Report	3 inches per second
Validation Mode	6 inches per second

Form Spacing



This parameter tells the printer how large the gap is between the bottom of the last bar code on the form and the bottom of the first bar code on the next form. This distance is important, because it affects how fast the printer can be set to run. If the bottom most bar code is very close to the form edge and the top most bar code of the next form is very close to the top of the form, the printer could

have trouble distinguishing which bar code report correlates with which form. To avoid the risk of miscorrelation, the printer will limit the speed of the printer, based on the information given here to insure the validation results are always accurate.

To change the form spacing:

1. The printer must be in offline mode. If the printer is online, press the PAUSE key to take the printer offline.
2. Press ⋮☰ to enter the printer menu. Continue to press ⋮☰ until “VALIDATOR” appears on the printer display.
3. Press ↓ until "Form Spacing” appears on the printer display.
4. Press + or - to scroll through the choices: 0.2”, 0.3”,... 0.6”,..., 1.6”, 1.7”. Default.is 0.6".
5. Press ↵ to select the desired value.
6. Relock by pressing ↓ and ↵ together, then press PAUSE to put the printer back online.

Use this following equation to determine printer speed in relation to report type and form spacing:

Table 3. Report Correlation Speed Limits

Short Report:	Form Spacing $_{inches}$ X	(16.5)	= Print Speed $_{ips}$
Validation Report:	Form Spacing $_{inches}$ X	(10.9)	= Print Speed $_{ips}$
Full Report:	Form Spacing $_{inches}$ X	(6.1)	= Print Speed $_{ips}$

NOTE: To avoid the risk of miscorrelation, the printer automatically sets its limit speed based on the information that has been selected to ensure validation results are accurate.

Demand Printing Modes

In order for each bar code to be successfully validated, the entire code must pass through the scanning laser, even when the printer is set up for demand printing mode. In cases where the bar code is

close to the bottom of a label and the printer is in a demand print mode, the printer automatically pushes the label past the scanning laser. Once the bar code is validated, the printer retracts the label back to be cut or torn off.

Because the printer has to push out and then retract labels in demand modes, the extra movements slow the printing process. You can avoid this by adjusting the form itself so that the bar code appears “early” enough on the form so that it will pass completely through the laser scanner during normal printing. This may involve rotating the form or moving the bar code to a different position on the form.

Calibration Warning

The validator can determine if it is out of calibration. When this occurs, the validator communicates this condition as part of a bar code report. In addition, the “Calibration” indicator lamp flashes and the message “`Validator needs calibration`” is displayed on the printer. The message is a warning, and does not stop printer operation.

Press the PAUSE key to clear the message. Perform the calibration procedure, described on page 22.

Ambient Light Fault

The validator’s scanning laser cannot work properly in a room with excessive ambient light, including direct sunlight. If the validator senses that proper scanning could be compromised by the surrounding ambient light in the room, printing stops and the error message “`Ambient light/Validator failure`” appears on the printer display. Press the PAUSE key to clear the fault message, then take the appropriate action to minimize the ambient light surrounding the validator. This may involve moving the printer to a darker area of the room.

Bar Code Failures

There are two cases where the validator will notify the printer to alert you to a fault situation: if the validator detects a bad bar code, or if it detects no bar code where it expects to find one. How the printer reacts to these faults are determined by the printer's configuration settings, described below.

Bad Bar Code Error Detection

The validator examines each bar code which passes through the laser scanner and sends an analysis report to the printer. If a bar code is reported to have failed to meet any of the criteria, an error condition is reported. How the printer then reacts is described in the "Error Action" section, below.

Missing Bar Code Error Detection

For many reasons a bar code may print so poorly that the validator cannot detect it, and the printer does not receive an analysis report for the code. To catch this problem, the printer tracks the position of the last label printed and knows when it should have completely passed the validator beam. It can then compare the number of bar code analysis reports it expected to the number it received. If the printer does not receive enough bar code reports, it enters an error condition. How it then reacts is described in the "Error Action" section, below.

The number of bar codes expected is determined one of two ways:

- If "Auto" is selected for the "Number of Codes" parameter, and you are using LinePrinter Plus® or IGP®/PGL® or IGP Code V™ or IPDS graphics software, the printer compares the number of bar code commands it receives from the software to the number of analysis reports it receives from the validator.
- You can set the number of bar codes generated by a bitmapped image that the printer should expect per form by selecting a value in the "Number of Codes" parameter.

For more information on choosing a value for the “Number of Codes” parameter, see “Setting Number Of Bar Codes On A Form” on page 35.

Error Action

Whether an error stems from a bad or a missing bar code, the printer response is identical. How the printer responds is determined by the configuration menu.

To define how the printer responds to validation errors:

1. The printer must be in offline mode. If the printer is online, press the PAUSE key to take the printer offline.
2. If the ↵ key is locked, unlock it by pressing ↓ and ↵ together. (This key combination may be set to two different keys. See “Configuring the Printer” in your *User’s Manual* for details.)
3. Press ⁝☰ to enter the printer menu. Continue to press ⁝☰ until “VALIDATOR” appears on the printer display.
4. Press ↓ until “Validator Action” appears on the printer display.
5. Press + or - to scroll through the choices:
   - Stop
   - Overstrike
   - Reprint
6. Press ↵ to select the desired value.
7. Relock by pressing ↓ and ↵ together, then press PAUSE to put the printer back online.

Each of the “Validator Action” parameters is described below.

Stop

If the system detects a bar code failure, the print job stops, the printer indicator lamp flashes, the alarm sounds, and the appropriate error message is displayed.

The printer remains in a fault condition until you press the PAUSE key. This clears the error message and puts the printer in the offline state. You must correct any condition that may have caused the fault. When ready, the printer can be placed back online and resumes printing where it left off.

Overstrike

Use Overstrike mode in situations when you want bad labels to be marked, but not reprinted; for example, when using pre-numbered labels.

If the system detects a bar code failure, the print job stops, the printer indicator lamp flashes, the alarm sounds, and the appropriate error message is displayed.

Without pausing, the printer then automatically reverses to the top of the form containing the failing bar code. It then overprints an obliterating pattern over the form and any other forms partially printed prior to the physical stop. The obliterating pattern is a grid of fine lines or a grey fill that obviously marks the label as bad and yet allows some visibility as to what was originally printed.

After the overstrike printing, the printer clears the error message and stops the alarm itself, then resumes normal printing at the point the job was stopped. The overprinted labels are lost and a separate print command is required to resend them from the host, if needed.

Reprint

This mode is similar to the Overstrike mode, however, instead of resuming printing where the printer had left off, the printer will attempt to reprint the bad form.

The printer will stop, indicate an error, and overstrike as described above. Then it will skip a number of blank labels (depends on the setting for “Skip Labels”, see “Setting For Skip Labels” on page 38) and slew to the next top of a blank form, and reprint the entire form that contained the bad bar code and any other forms that were perhaps interrupted by the error. Note, because of physical differences between the location of the print head and the laser scan line, it is likely that a second form will be started before the

first form has finished being assessed. Therefore, the reprint operation will need to reprint more than just the form with the error.

If the printer has to reprint the same form five times in a row, the print job stops completely and behaves the same as in Stop mode (see above).

Error Messages

There are a number of errors the validator can detect. When one of these errors occurs, the validator alerts the printer to perform the currently selected error action (see page 50), and show the appropriate error message on the printer display. The possible error messages and their meanings are explained below.

Bar Code Improper Data Format

The bar code is not properly encoded. For example, a check sum is incorrect, a required number of characters is not met, or required terminator characters are not included. In almost all cases, this problem would be caused by incorrect form or host application design.

Bar Code Quiet Zone Too Small

The blank zone surrounding the bar code is not big enough to meet the minimum requirement. This can typically occur in forms where bar codes are placed too close to other elements, or the bar code is too close to an edge of the media, or the media's position is shifting. The minimum quiet zone on each end of the barcode is ten times the minimum element width or .25 inches, whichever is greater.

Contrast Too Low/Check Media

The contrast between bars and spaces is not sufficient. This can be caused by too little heat in the thermal transfer, or by use of colored media or ribbons.

Poor Scanning/Check Media

The validator detected gross inconsistencies within the height of the bar code. These types of failures are likely attributed to large blemishes within the bar code, such as a wrinkle.

Poor Scanning/Inspect Head

The validator detected unexpected dark spots in spaces or light spots in bars. Generally, this is an indication of a poor ribbon/media combination, the print head needing cleaning, or a burned pixel.

Poor Scanning/Check Heat & Head

The difference between wide and narrow elements is too close for the validator to reliably discern. Generally, this indicates an improperly set heat/speed/pressure combination, or the loss of the heating element.

Unscannable Code/Check Media

An expected bar code is missing, or was printed so badly the validator cannot detect it.

Checksum Failure

The barcode data fails the checksum check or is missing the checksum digit.

Maintenance

WARNING Using controls, making adjustments, or performing procedures other than those specified herein may result in hazardous radiation exposure.

WARNING Class 2 laser light. Do not stare into the laser beam or a reflected image of the laser beam.

As a self-contained unit, the data validator requires very little maintenance.

Every so often, the glass should be cleaned to maintain scanning integrity. Use a household glass cleaner and a dry, lint-free cloth to clean the glass.

If the problem with the printer is not fixed by one of these troubleshooting methods, call your authorized service representative or Printronix Technical Support.

Troubleshooting

If you are having problems with the validation process, consult Table 4 for a list of problems and possible solutions.

Table 4. Troubleshooting

Problem	Solution
The validator laser does not come on.	1. Make sure the power cord is plugged into the validator. See “Installation” on page 12. 2. Make sure the validator has not been disabled in the printer configuration menu. See “Enabling and Disabling The Validator” on page 30. 3. Call your service representative if problem persists.

Table 4. Troubleshooting (continued)

Problem	Solution
The validator laser beam does not cover the entire width of the labels being printed.	1. Make sure that the validator is located at the right notch. Refer to Figure 3B for detail on location of notch. 2. After locating the right notch, use "Beam Shift" to move the beam horizontally to cover the entire width of the labels.
Printing 3-mil or 5-mil x-dimension width bar codes constantly causes error messages.	The validator does not recognize x-dimensions as small as 3-mil or 5-mil. If you have to print bar codes this size, disable the validator to prevent error reports. See “Enabling and Disabling The Validator” on page 30.
The printed labels look clean, but the validator is still reporting an error message.	The validator glass may be dirty, distorting the report results. Power down the printer and validator. Clean the glass using a household glass cleaner and a dry, lint-free cloth.
The “Calibration” indicator on the validator is flashing and/or the printer display indicates that the validator is out of calibration.	Calibrate the validator. See “Calibration” on page 22.
The error message “`Ambient light/Validator failure`” appears on the printer display.	The validator is in an area of the room with excessive ambient light. See “Ambient Light Fault” on page 48.
The validator reports a quiet zone violation when printing bar codes with an x-dimension greater than 40 mils.	The printer does not recognize a bar code with an x-dimension greater than 40 mils. If you have to print bar code this size, disable the validator to prevent error reports. See “Enabling and Disabling The Validator” on page 30.

Table 4. Troubleshooting (continued)

Problem	Solution
The printed bar codes are causing error conditions.	There are a number of factors which could be causing validation errors: • Make sure the validator is enabled. • Scanner Beam is not properly aligned with two notches on the tear bar of the printer. Follow the validator alignment section to ensure the proper alignment of the beam. • Validator and printer are not properly communicating. Follow the Barcode Demo section to ensure the proper operation of the validator without using a host to send file. • Bar code width. The validator can recognize x-dimensions as narrow as 6.6-mil for 300 dpi printers, and 10 mil for 200 dpi printers. The validator cannot recognize x-dimensions smaller than 6.6 mil or larger than 40 mil. • Bar code size. A minimum height of 1/8” is required for validation.
	• Bar code spacing.The validator requires a minimum distance of 1/2” or 20 times the minimum element width, whichever is greater, between bar codes. • Printer speed. See “Print Speed Limits” on page 44 for more information. • Be sure the bar code is not printing on the extreme edges of the label. • Check the number of bar codes being validated concurrently. The validator can track the performance of up to four bar codes at one time.

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