PRINTRONIX®

Online Data Validator User's Manual

SL5000r™ and T5000r™
RFID Smart Label and Thermal Printers

SL5000r and T5000r
RFID Smart Label and Thermal Printers
Online Data Validator Administrator's Manual

PRINTRONIX®

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Communication Notices

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Unauthorized changes or modifications could void the user's authority to operate the equipment.

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Any change or modification to this product voids the user's authority to operate it per FCC Part 15 Subpart A Section 15.21 regulations.

This product contains an intentional radiator with the following parameters:
Operating Frequency: 902 to 928 MHz
Typical RF Power: 25 to 100 milliwatts (SL5x04 MP) or 25 to 205 milliwatts (SL5x04 C1)
Maximum RF Power: 1 Watt under abnormal conditions

Printronix SL5000r and T5000r

FC Tested To Comply
With FCC Standards

FOR HOME OR OFFICE USE

Canada

This Class B digital apparatus complies with Canadian ICES-003 and RSS 210.

Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.

Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

This device has been designed to operate with the antennas listed below, and having a maximum gain of –18 dBi. Antennas not included in this list or having a gain greater than –18 dBi dB are strictly prohibited for use with this device. The required antenna impedance is 50 ohms.

To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropically radiated power (e.i.r.p.) is not more than that permitted for successful communication.

CE Notice (European Union)

Marking by the CE symbol indicates compliance of this Printronix system to the EMC Directive and the Low Voltage Directive of the European Union. Such marking is indicative that this Printronix system meets the following technical standards:

- EN 300 220-1 (2000), Electromagnetic Compatibility and Radio Spectrum Matters; Short Range Devices; Radio equipment to be used in the 25 MHz to 1000 MHz frequency range with power levels ranging up to 500 mW.
- EN 55022 — "Limits and Methods of Measurement of Radio Interference Characteristics of Information Technology Equipment."
- EN 55024 — "Electromagnetic Immunity Requirements for Information Technology Equipment"
- EN 60950 — "Safety of Information Technology Equipment."

Printronix cannot accept responsibility for any failure to satisfy the protection requirements resulting from a non-recommended modification of the product, including the fitting of non-Printronix option cards.

This product has been tested and found to comply with the limits of Class A Information Technology Equipment according to European standard EN 55022. The limits for Class A equipment were derived for commercial and industrial environments to provide reasonable protection against interference with licensed communication devices.

> **WARNING**
>
> This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.
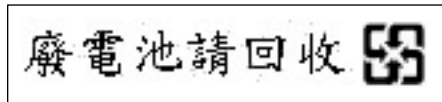
CE Symbol

$C\,\epsilon$

Taiwan

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Lithium Battery Warning

The controller board contains a lithium battery sealed inside the real-time clock chip. Do not disassemble the chip to replace the battery. Do not dispose of the chip by incineration. Failure to comply may cause the battery to explode. Contact your local waste agency for the correct disposal procedure.

廢電池請回收

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Printronix Online Data Validator (ODV) Compliance Statement

The Printronix Online Data Validator gathers data per the ISO/ANSI method of verification to perform practically all the industry standard bar code quality parameter calculations. These include all ISO/ANSI method parameters, PCS, ratio, X dimension calculation, modulo check digit calculations, average bar deviation, etc., along with decoding the symbol.

Reflectance Compliance – 660 nm Wavelength (Red) Light

The reflectance values embedded in the calibration symbol supplied with each ODV are traceable to Applied Image Primary Verification Calibrated Standard per ANSI X3.182 Step Reflectance Chart (see note 2.) Applied Image certified Calibration Standards are manufactured to Applied Image, Inc. and Uniform Code Council, Inc. specifications, using ANSI X3.182-1990 methodology, and are calibrated using standards traceable to the National Institute of Standards and Technology (N.I.S.T.)

ISO/ANSI Method Compliance

The Printronix ODV gathers data and performs all ISO/ANSI method parameter calculations per the ISO/IEC 15416 and ANSI X3.182-1990 methodologies with a few special considerations and exceptions. The ODV also conforms to ISO/IEC 15426 per the requirements specified in Section 2. The exceptions and considerations are related to the instrument's design and mission. The design incorporates a proprietary analog laser scanner that can be assembled with various focus lengths to produce different beam spot sizes. The mission is to not only analyze bar code quality, but also to detect any printer failures, process failures or media problems. For maximum performance and to conform to quality specifications, a fixed mounting distance and angle are required. A beam spot size able to detect errors of the particular print method is highly recommended.   This beam spot size used may or may not correspond to the recommendations in various specifications that it be related to the X dimension of a particular symbol, but instead correspond to the printer's resolution or some other parameter(s) critical in the application. A major philosophy of an on-line verification system is; if the printer and/or process is operating correctly and the media has proper reflectance properties, the best print quality for that particular print method and material is achieved by definition.

Special Considerations

1. Final system tests are performed at the proper focus distance and at an angle of 22 degrees. Units with common focus distances are checked to yield analysis results within +/- 4 % of all target values except +/- 3% for the Rmin calculation.

2. The standard ODV has an 8 inch focus distance creating a spot size that gathers light equivalent to a 6 mil round aperture. For these models, final test includes analyzing UPC symbols on the Calibrated Conformance Standard Test Card for EAN/UPC Symbol Verifiers. Results are checked to be within +/- 4% (+/- 3% for Rmin) of the marked values on the test card.

3. All ODV's use the same laser diode with a wavelength of 660 +/- 10 nm. Therefore, any ISO/ANSI overall symbol grade calculated by an ODV includes 660 as the wavelength portion of the grade.

Exceptions to the ISO/ANSI Method

1. The Defects calculation does not include the quiet zone area. A separate quiet zone check is implemented to more easily isolate print problems vs. setup problems in an on-line environment.

2. A laser spot is used instead of a round aperture. The spot size is dependent on the focus distance of the unit's optical system.

Table of Contents

1 *Installation Instructions*

Overview

The online data validator (ODV) is an external bar code scanning device attached above the paper exit of the printer. When activated, it scans the printed output looking for bar codes. When it 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 entire bar code has passed under the scanning 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 48.

Operational Parameters

The design parameters of the validator are as follows:

- The validator can track the performance of up to four horizontal bar codes at one time.
- The validator requires a minimum distance of 1/2 inch or 20 times the minimum element width (x-dimension), whichever is greater, between bar codes.
- The validator recognizes the following linear, picket fence bar codes: Codabar, Code 39, Code 93, Code 128, Interleaved 2 of 5, and UPC/EAN.
- The validator can also evaluate 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 Defects Percentage, Percent Decode, and Decodeability. For lower security levels, lower the Defects Percentage to 5% to enable checking for bar code damage.
- Stacked, 2D, and vertical (ladder) bar codes are not supported.
- Bar codes must have a minimum x-dimension of 10 mil (0.010 inch) to be recognized by the full width of the scanning beam. The validator can recognize bar x-dimension as narrow as 6.6 mil (0.0066 inch) for 300 dpi printers, and 10 mil (0.010 inch) for 203 dpi printers. The validator cannot recognize x-dimensions smaller than 6.6 mil (0.0066 inch) or larger than 40 mil (0.040 inch).

Refer to Table 1 for the minimum x-dimension requirements for each printer size of a 300 dpi printer.

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

Printer Size	Beam Width	Minimum X-Dimension
4 inch	4.5 inches	6.6 mil
6 inch	6.5 inches	10 mil

8 inch	8.5 inches	13 mil

Tools and Materials You will Need

- *SL5000r/T5000r Administrator's Manual*
- Static wrist strap*
- 2.5 mm hex key*
- #2 Phillips Screwdriver*

Parts List

- 3 mm hex key
- Validator and mounting screws
- Validator bracket, mounting screws, and skew adjustment screw
- Extended Media Width Guide*
- Cable ties, black
- Bar code calibration card
- Ferrite*
- Cable assembly*
- Wire saddle*
- Grommet*
- ODV Interface PCBA (used for SL/T5000r Energy Star models only)

* Only for a field installation

Safety Notices

The validator is a Class 2 laser product. The following notices apply at all times when the printer is powered on and the validator is active:

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

WARNING **Using controls, making adjustments, or performing procedures other than those specified herein may result in hazardous radiation exposure.**
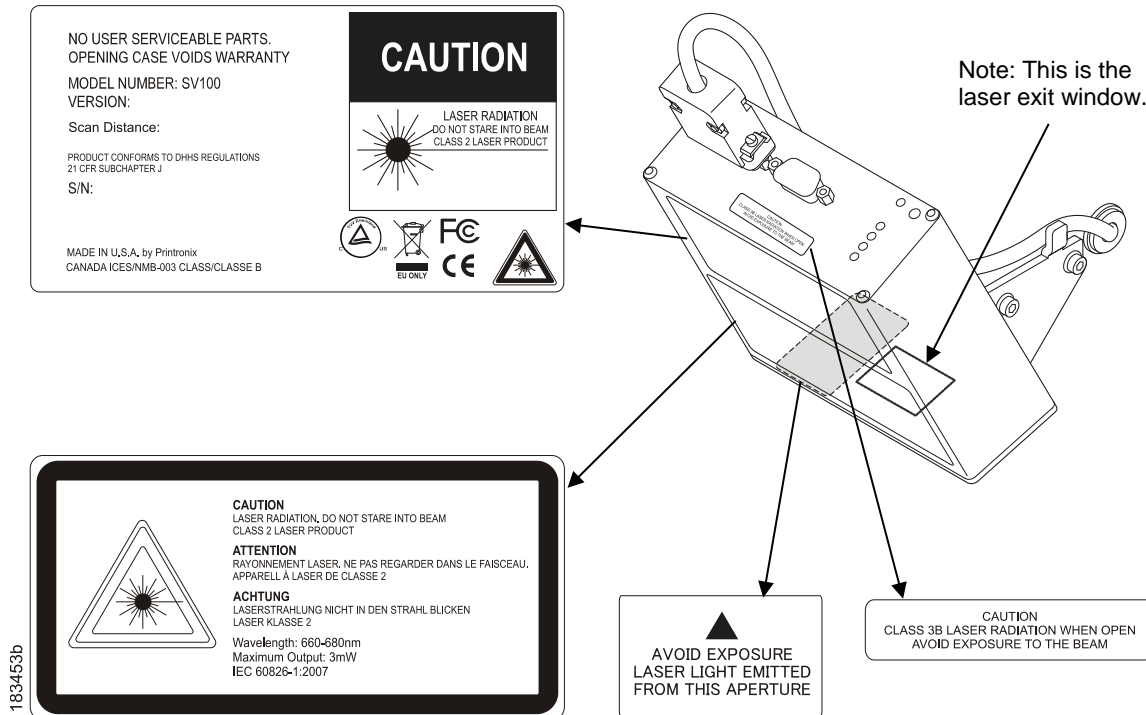
NO USER SERVICEABLE PARTS.
OPENING CASE VOIDS WARRANTY

MODEL NUMBER: SV100
VERSION:

Scan Distance:

PRODUCT CONFORMS TO DHHS REGULATIONS
21 CFR SUBCHAPTER J

S/N:

MADE IN U.S.A. by Printronix
CANADA ICES/NMB-003 CLASS/CLASSE B

CAUTION

LASER RADIATION
DO NOT STARE INTO BEAM
CLASS 2 LASER PRODUCT

EU ONLY

Note: This is the laser exit window.

183453b

CAUTION
LASER RADIATION. DO NOT STARE INTO BEAM
CLASS 2 LASER PRODUCT

ATTENTION
RAYONNEMENT LASER. NE PAS REGARDER DANS LE FAISCEAU.
APPARELL À LASER DE CLASSE 2

ACHTUNG
LASERSTRAHLUNG NICHT IN DEN STRAHL BLICKEN
LASER KLASSE 2

Wavelength: 660-680nm
Maximum Output: 3mW
IEC 60826-1:2007

AVOID EXPOSURE
LASER LIGHT EMITTED
FROM THIS APERTURE

CAUTION
CLASS 3B LASER RADIATION WHEN OPEN
AVOID EXPOSURE TO THE BEAM

Figure 1. Safety Warnings

Installation and Removal

This section describes how to install the validator. To remove the validator, reverse the steps of this procedure.

Prepare the Printer

1. Set the printer power switch to O (Off).

WARNING   **Always unplug the printer power cord from the printer or power outlet before doing any installation procedure. Failure to remove power could result in injury to you and damage the equipment. You will be instructed when to apply power.**

2. Unplug the printer power cord from the printer or the AC power source.

Factory Installation

If your printer has a factory installed validator, the ferrite, cable, wire saddle, grommet, and extended media width guide have already been installed. Go to "Install the Validator" on page 27

If you are doing a field installation, you must install the ferrite, cable, wire saddle, grommet, and extended media width guide. Go to "Install the Ferrite" on page 17.

Install the Ferrite

1. Loosen the two captive screws securing the top of the frame side cover. (Figure 2.)

2. Tilt the frame side cover back from the top and lift it until the tabs along the lower edge disengage from the slots in the printer frame.

183454a

Captive Screw (2)
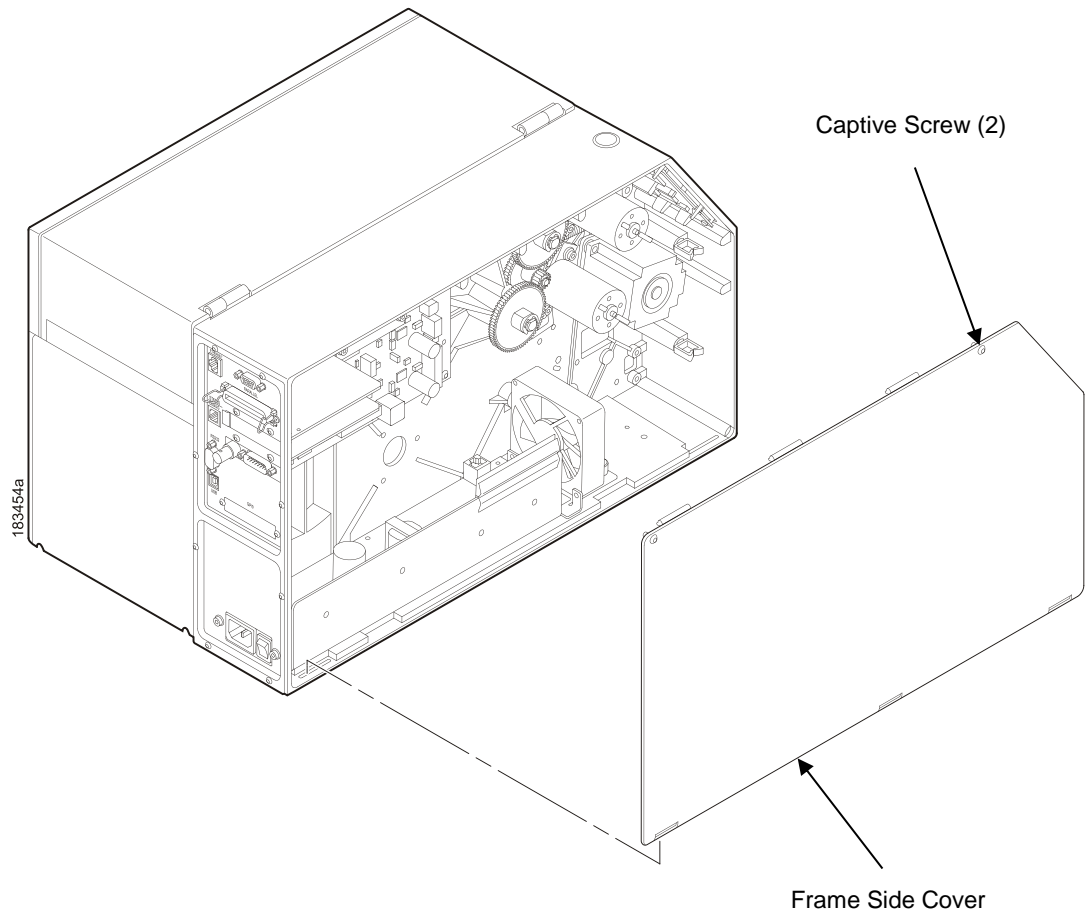
Frame Side Cover

Figure 2. Removing the Frame Side Cover

DB15 Connector

183455a
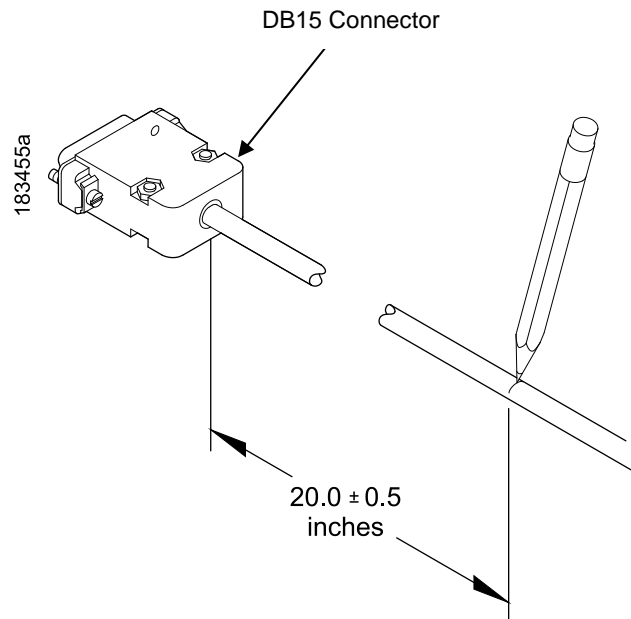
20.0 ± 0.5
inches

Figure 3. Locating the Ferrite Position on the Power/Data Cable

3.   Stretch the Power/Data cable out straight on a flat surface.

4.   Measure back 20.0 ± 0.5 inches from the DB15 connector and mark the cable with a
      pencil line. (Figure 3.)

P10 Connector

Frame Opening

Plastic Plug

183456a
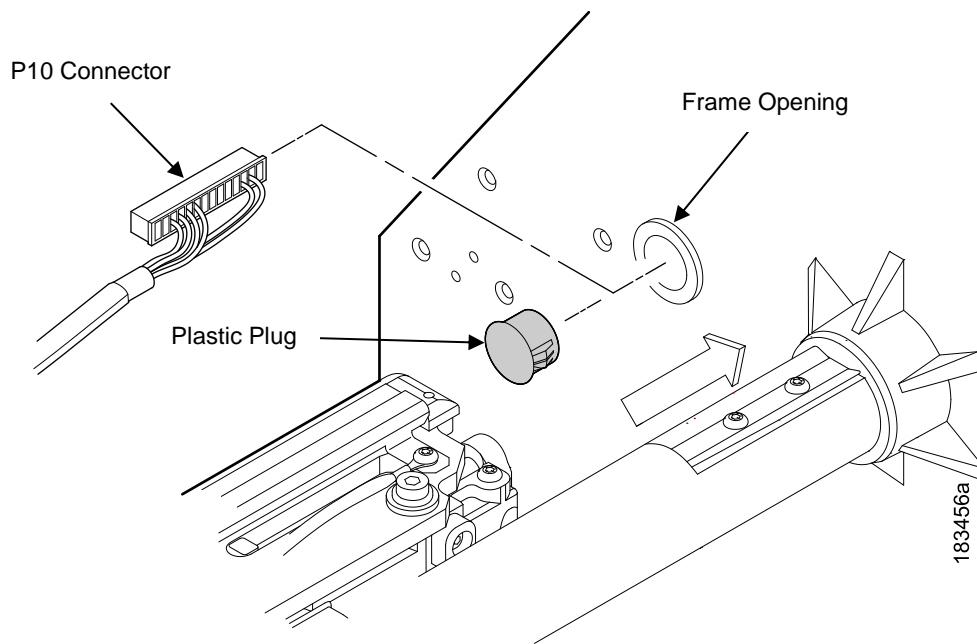
Figure 4. Routing the Power/Data Cable

CAUTION   **To prevent electrostatic damage to electronic components, always wear a properly grounded static wrist strap when you handle circuit boards.**

5. Put on a static wrist strap and ground it to an unpainted part of the printer frame. Touch the frame with the hand wearing the wrist strap.

6. Raise the media cover and remove the plastic plug from the frame opening.

7. Gently press the small wires of the P10 connector end of the power/data cable against the connector and route the connector through the frame opening. (Figure 4.)

183457a

P10 Connector
(to controller board)

Pencil Line
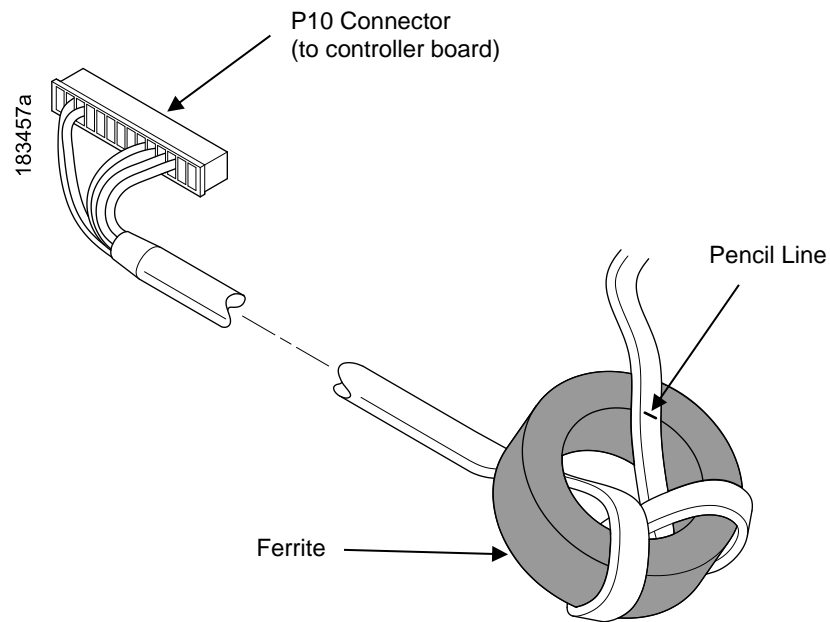
Ferrite

Figure 5. Wrapping the Power/Data Cable Around the Ferrite

8. Using the P10 connector end of the power/data cable, insert the cable through the ferrite. (Figure 5.)

9. Wrap the power/data cable around the ferrite twice.

10. Adjust the position of the ferrite so that the length from the ferrite to the DB15 connector is 20 ± 0.5 inches.

Frame Boss

Wire Saddle

183458a
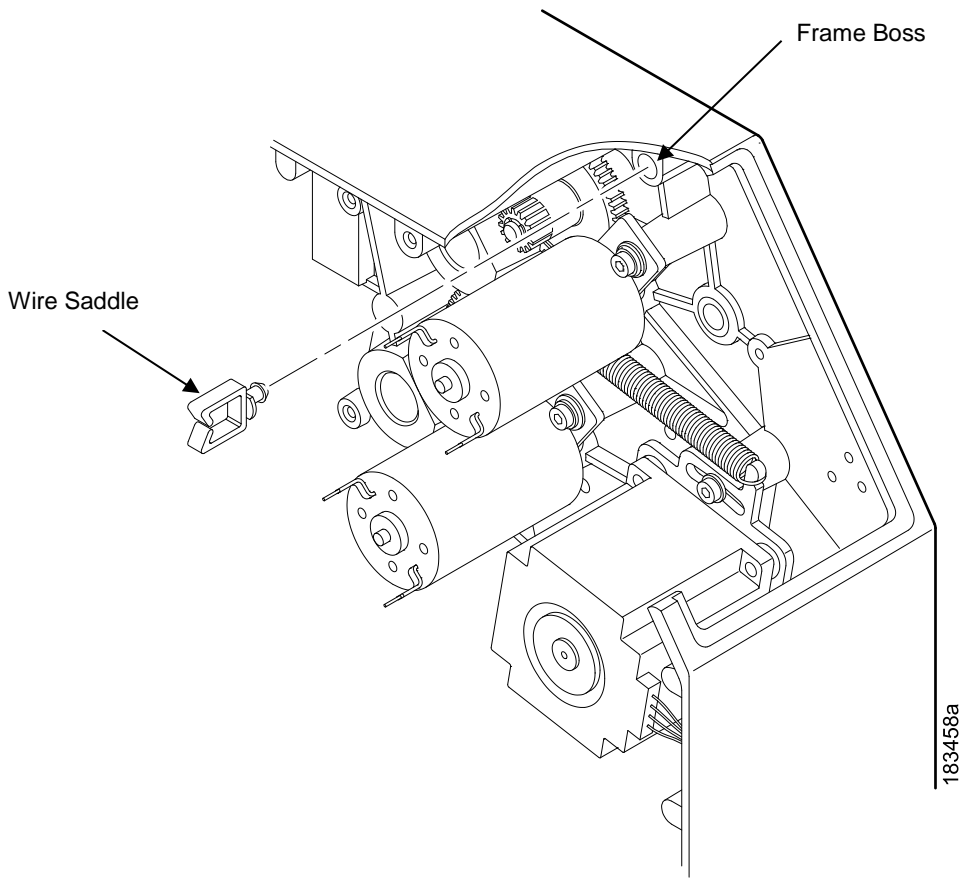
Figure 6. Inserting the Wire Saddle Into the Frame Boss

11. Insert the wire saddle into the frame boss. (Figure 6.)

Wire Saddle

183459a

Ferrite

Frame Opening
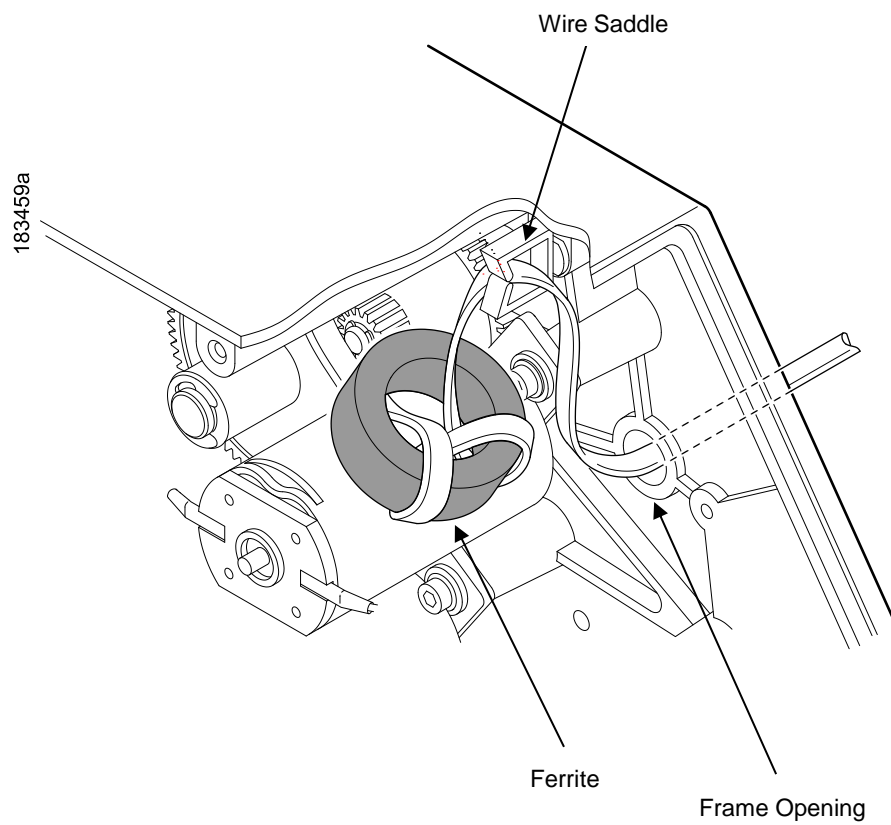
Figure 7.Routing the Power/Data Cable From the Hole in the Frame Wall

12. Route the power/data cable through the wire saddle.

DB15
Connector

Split
Grommet

Inserted Split
Grommet
(media side)

183460a

Power/Data Cable
(approximately 17
inches exposed)
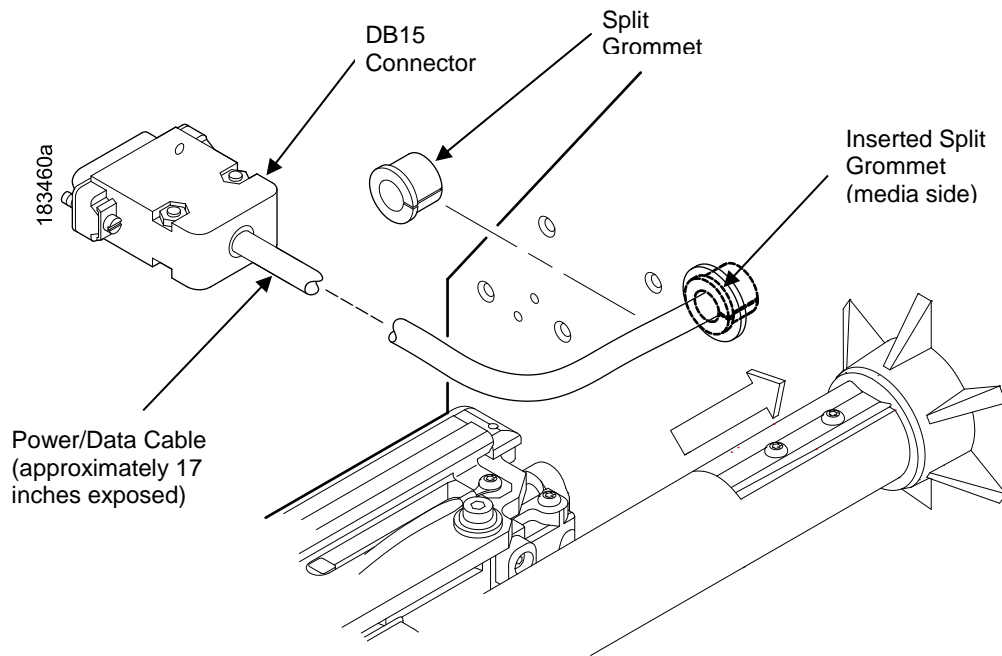
Figure 8. Adding the Grommet to the Power/Data Cable

13. On the media side of the printer, slide the split grommet onto the power/data cable and insert it into the frame opening. (Figure 8.)

14. Inspect the power/data cable to ensure approximately 17 inches of cable is exposed from the grommet to connect it to the validator.

NOTE: You will plug the power/data cable into the validator later.
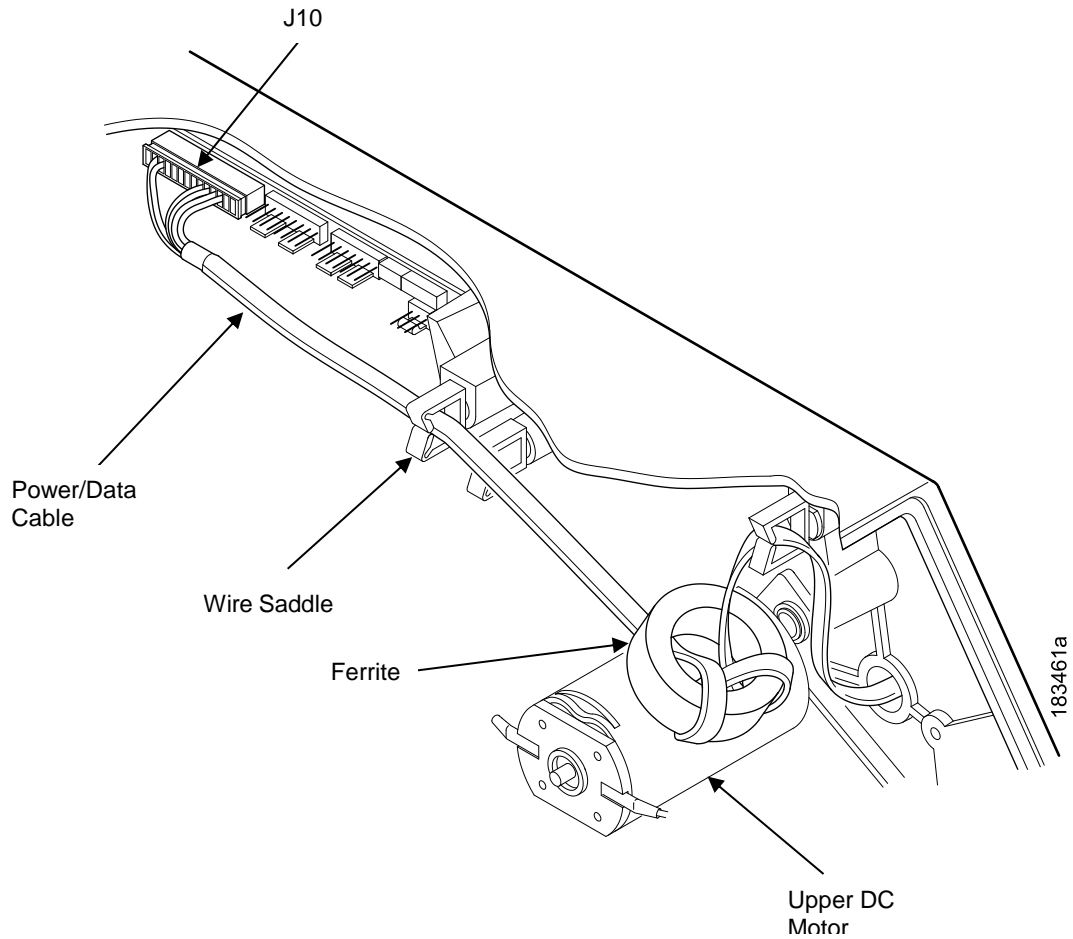
Figure 9. Position the Ferrite

15. On the electronics side of the printer, position the ferrite on top of the upper DC motor. (Figure 9.)

16. Route the power/data cable through the wire saddle as shown in Figure 9.

17. Plug the P10 connector end of the power/data cable into the J10 receptacle on the controller board.

NOTE: For SL5000r/T5000r Energy Star models see Figure 10 on page 25 .

J10

ODV Interface
PCBA

183658a
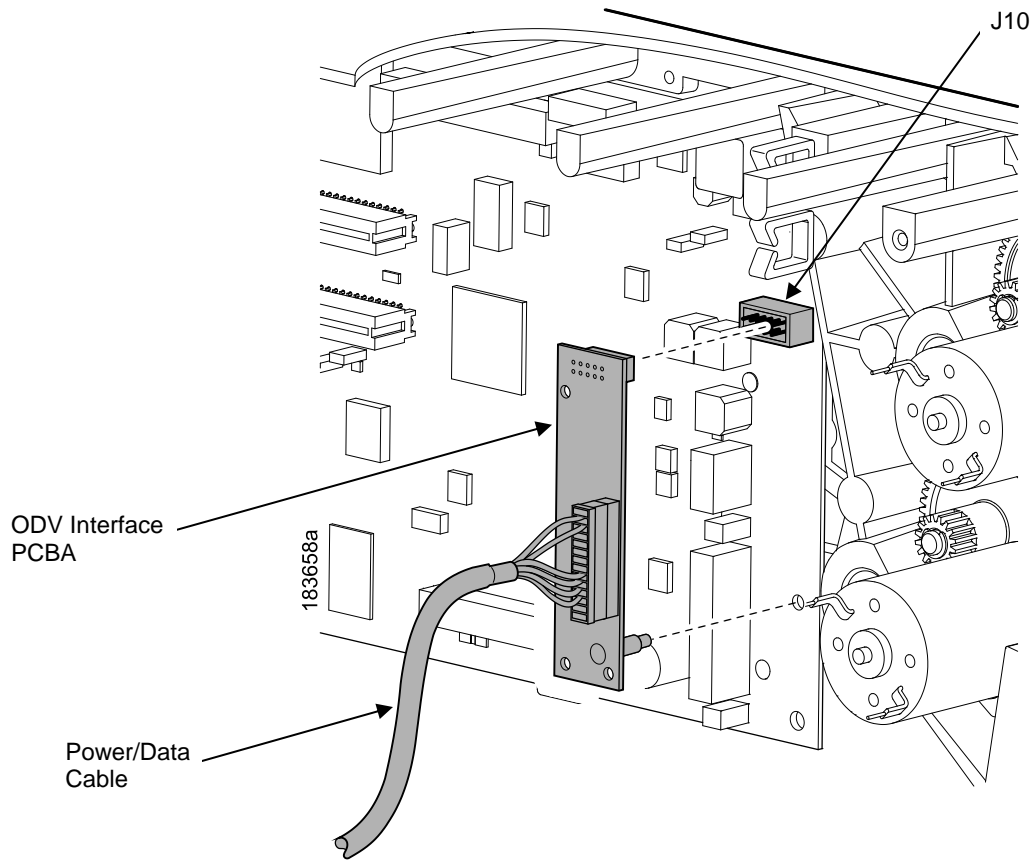
Power/Data
Cable

**Figure 10. SL/T5000r Energy Star Models – Plugging the Power/Data Cable into
the ODV Interface PCBA and then into the Controller Board**

NOTE: the media cover is removed for clarity in this view. Do not remove the media cover for this procedure.

Media Damper

Extended Media Width Guide

184232a
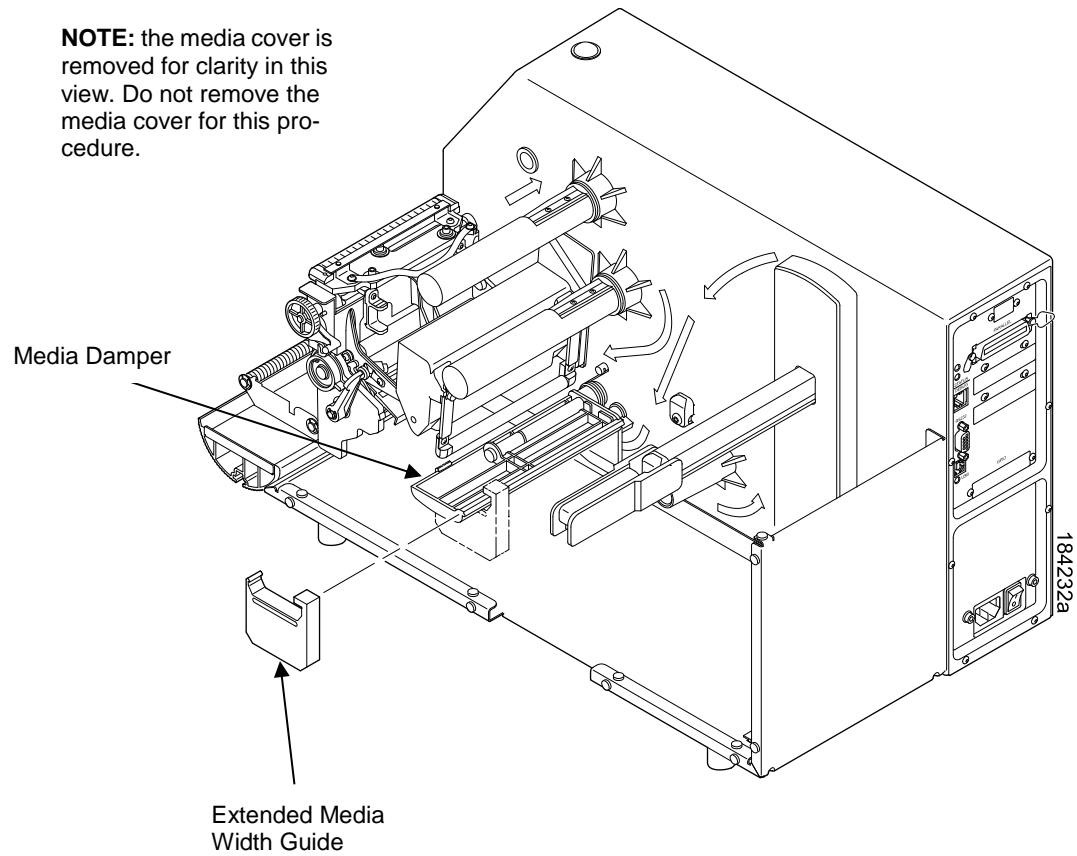
Figure 11. Replacing the Media Width Guide

18. Replace the standard (blue) media width guide on the media damper with the extended media width guide (Figure 11.)

Install the Validator

Validator

Bracket

6-32 Phillips
Screw (2)

183339a

4"
Printer

8"
Printer

6"
Printer
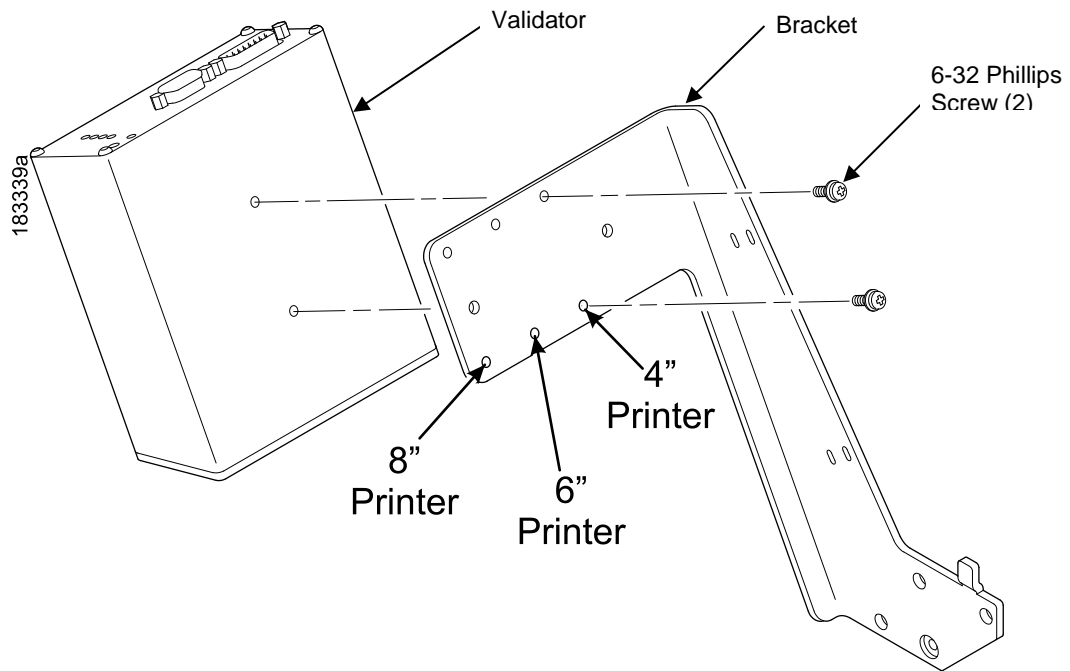
Figure 12. Attaching the Validator to the Bracket

1. Using two 6-32 Phillips head screws, attach the validator to the bracket as shown in Figure 12.

2. Use the appropriate holes on the bracket, depending on the media width.

183340a
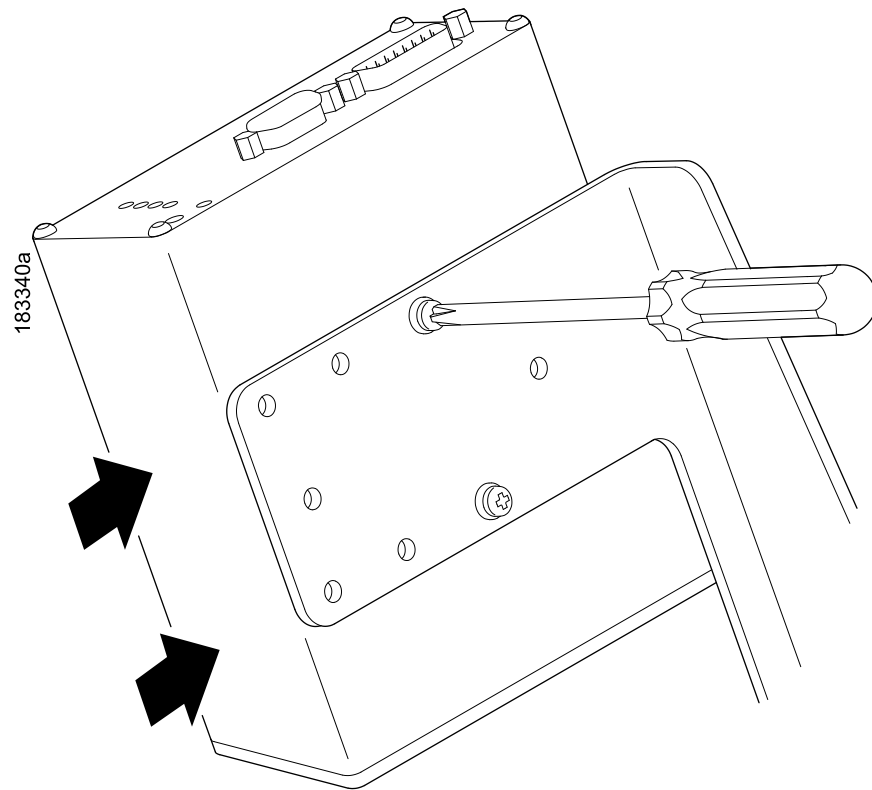
Figure 13. Positioning the Validator on the Bracket

1. Apply even pressure to the side of the validator as you tighten the screws on the bracket as shown in **Error! Reference source not found.**.

2. Make sure the validator is firmly seated against both screws to insure proper beam alignment.

Validator/Bracket Unit

M4x10mm
Screw (4)

183341a
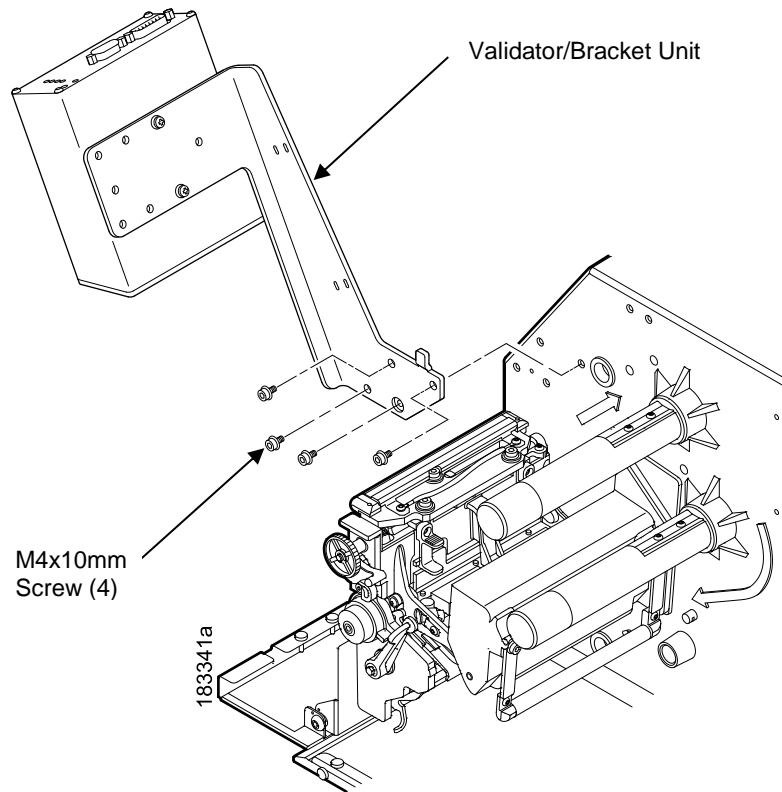
Figure 14. Attaching the Validator/Bracket Unit to the Printer

3. Face the front of the printer while installing the validator/ bracket unit.

4. Using four M4x10mm screws, attach the validator/bracket unit to the printer frame as shown in Figure 14.

5. Tighten the four screws finger tight. You will adjust the validator/bracket unit in a later step using the 3mm hex key (provided).

Attach the Power/Data Cable

Power/Data Cable
DB15 Connector

Bracket

Tie Wrap (2)

183342a

First Upper
Slot
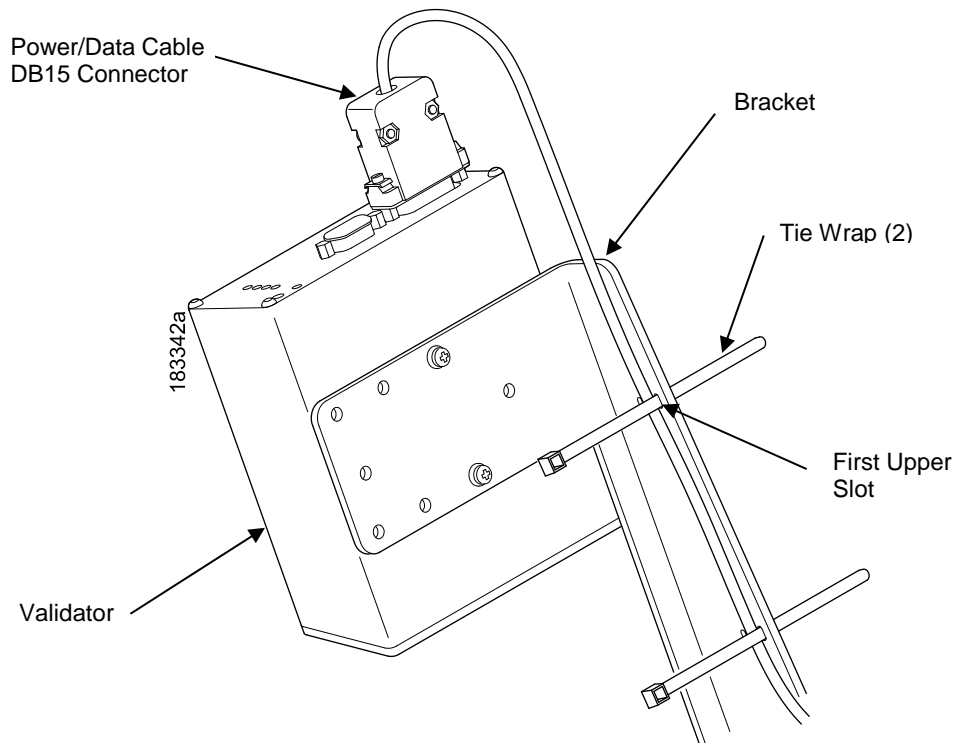
Validator

Figure 15. Attaching the Power/Data Cable

1. Plug the DB15 connector end of the power/data cable into the validator.

2. Route the power/data cable along the inside of the bracket, as shown in Figure 15.

3. Route a tie wrap from the inside of the bracket through the first upper slot as shown in Figure 15, keeping the power/data cable underneath the tie wrap.

Tie Wrap Head

Bracket Tab

Power/Data Cable

183343a
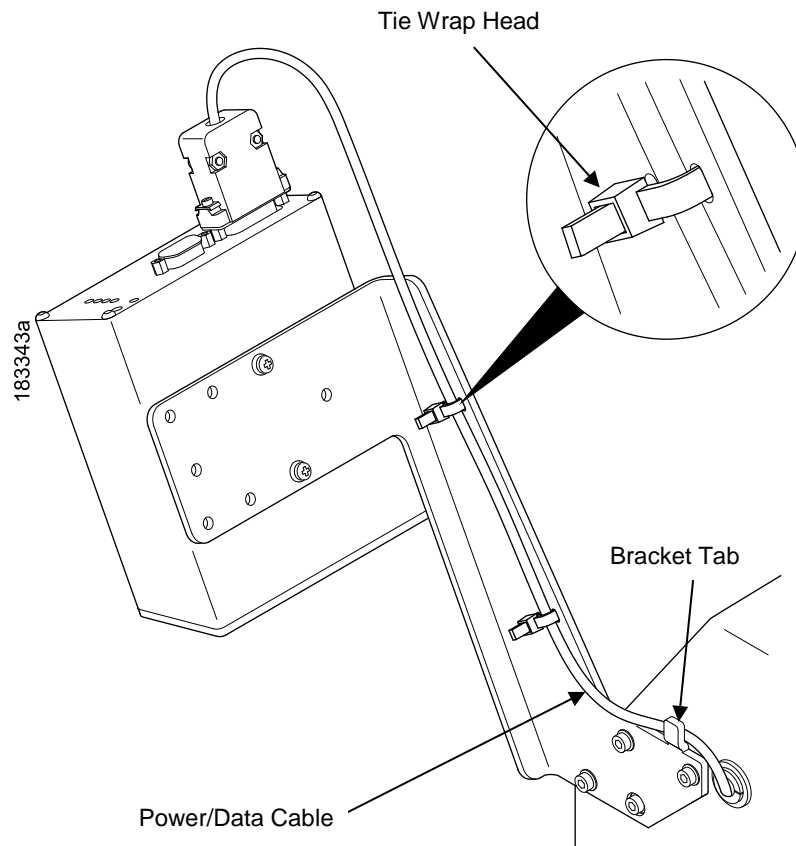
Figure 16. Securing the Power/Data Cable

4. Route the tie wrap back through the second upper slot and underneath the power/data cable and then through the tie wrap head, as shown in Detail A of Figure 16.

5. Pull the tie wrap just enough to hold the cable in place, but do not over tighten it.

6. Repeat step 3 through step 5 using the lower pair of slots.

7. Route the power/data cable behind the bracket tab as shown in Figure 16.

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

8. Gently pull the power/data cable to minimize the slack along and behind the bracket. Push any excess slack through the grommet.

9. Once the power/data cable is properly positioned, pull the tie wraps snug against the cable and bracket and cut off the excess.

Restore the Printer to Operation

1. Lower the media cover.

2. Engage the tabs on the bottom of the frame side cover in the slots in the printer frame.

3. Rotate the cover into position.

4. Tighten the two captive screws. (Figure 2.)

5. Plug the AC power cord into the printer and the power source.

6. Set the printer power switch to | (On).

Enable the Validator

NOTE: If you make any changes to the default configuration menu items, you will be prompted to save the configuration when you attempt to put the printer online. See "Auto Save Configuration" in the *Adminstrator's Manual*.

Software can automatically detect an installed validator when the printer is powered up. If the printer is powered up with Power-Up Config. set to Factory, the VALIDATOR menu will be available and Validator Funct. is set to Enable in the QUICK SETUP and VALIDATOR menus.

If Power-Up Config. is not set to Factory, the VALIDATOR menu appears, but Validator Funct. is set to Disable. Enable Validator Funct. by completing the following steps. (This is a one-time setting once you save the configuration.)

IMPORTANT   **Do not enable or disable the validator with data in the buffer. See "Resetting Validator Data" on page 50.**

1. Press ⫦ to take the printer offline and place the printer in Menu mode.

2. If necessary, press ↓ and ↵ at the same time to unlock the ↵ key. (This key combination can be changed by the user. Use the customer's key combination if necessary.)

3. Press ⫦ until VALIDATOR displays.

4. Press ↓ until Validator Funct. displays.

5. Press + or – until the Enable displays.

6. Press ↵ to enable the validator. An asterisk (*) should appear after Enable. Once enabled, the printer will command the validator to begin scanning and reporting errors, and the counters will be incremented.

7. Press ↓ and ↵ at the same time to lock the ¿ key, then press **PAUSE** to take the printer offline.

8. Press **PAUSE** again to put the printer online.

Adjust the Scanning Beam

NOTE: Make sure the printer is on and the scanning beam is on. If the beam is off, press the **RESET** button for less than 2 seconds to turn on the beam.

Continuous, Tear-Off, and Tear-Off Strip

When the validator is first installed, the scanning beam may need to be aligned with the two notches on the sides of the tear bar, as shown in Detail A of Figure 17. When the scanning beam is properly aligned it will line up with the two notches.
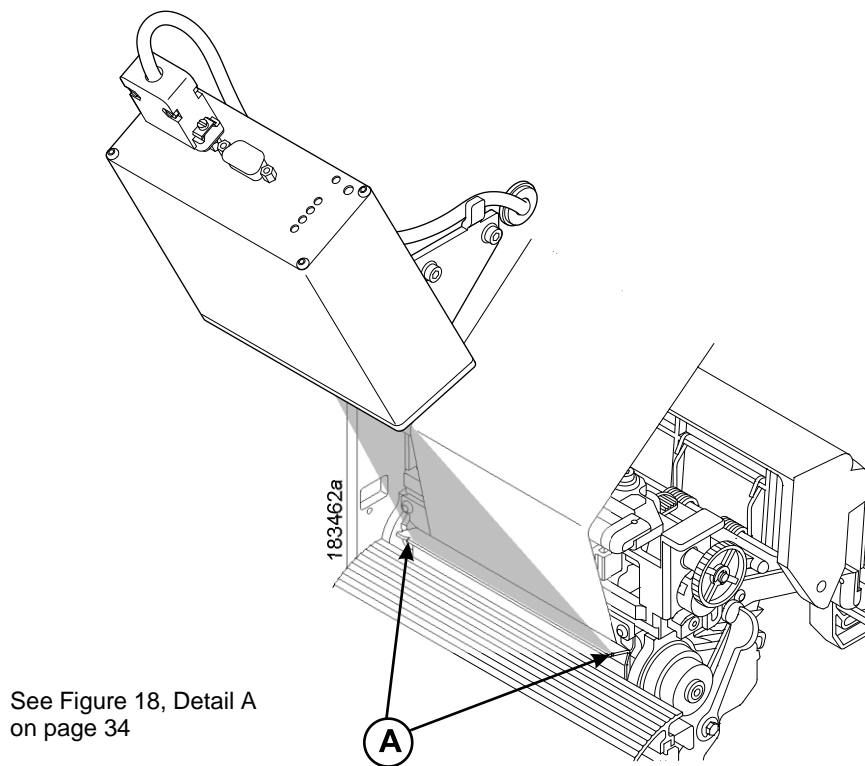
See Figure 18, Detail A
on page 34

Figure 17. Aligning the Scanning Beam: Continuous, Tear-Off, and Tear-Off Strip Media Handling Modes Only
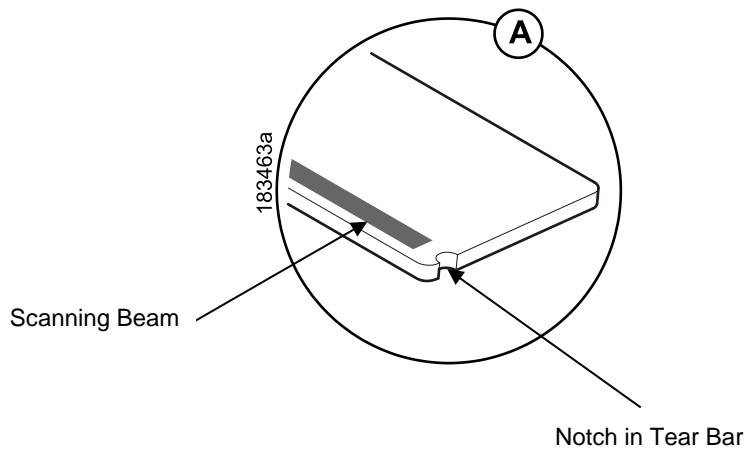
Figure 18. Scanning Beam Location

Peel-Off Media Handling Mode

If your printer is configured for Peel-Off Media Handling mode (use of optional internal rewinder), you may need to align the beam further behind the notches (0.14 to 0.20 inches [3.56 mm to 5.07 mm] from the front edge of the tear bar) so that the peeled label remains on the tear bar and the trailing edge of the last bar code can still pass completely under the scanning beam. See Figure 19.

Aligning the scanning beam to any position other than the notches on the tear bar should only be done if the last printed bar code image does not clear the beam when the label is at the peel-off position after printing. In addition, the distance the beam moves back from the tear bar edge must correspond to a distance from the leading edge of the label that does not have bar code printing. For example, aligning the beam 0.16 inches from the front edge of the tear bar requires that 0.16 inches of the leading edge of the label must not have bar code images.
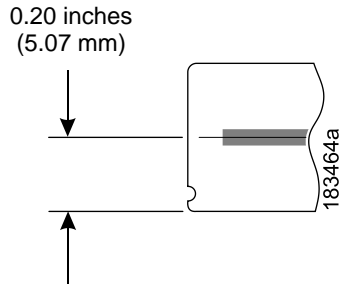
0.20 inches
(5.07 mm)

183464a

Figure 19. Aligning the Scanning Beam: Peel-Off Media Handling Mode Only

Cut Media Handling Mode

If your printer has a cutter installed and is configured for Cut Media Handling Mode, align the beam at the notches at each side of the opening on the upper enclosure, as shown in Detail A of Figure 20.

IMPORTANT   **The beam must make direct contact with the media, not the inside metal part of the cutter. See** Error! Reference source not found. **for instructions on how to adjust he vertical position of the beam.**
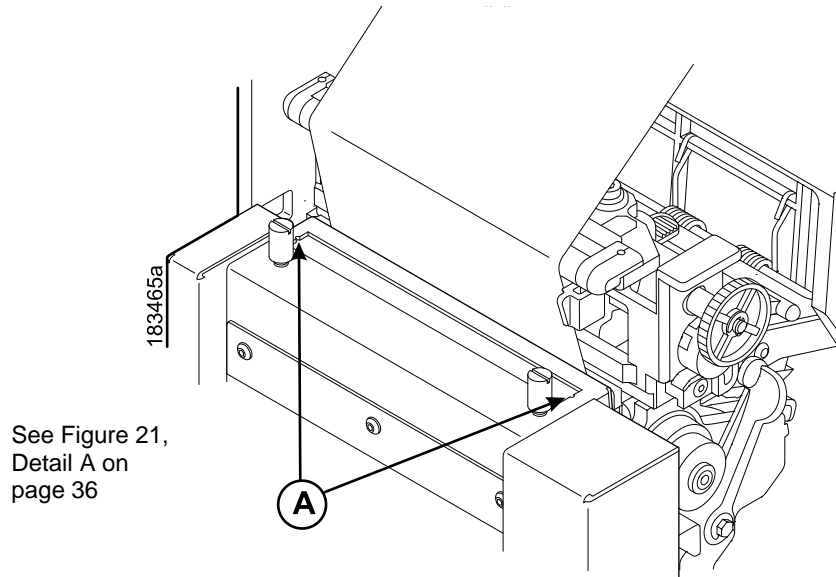
183465a

See Figure 21,
Detail A on
page 36

A

Figure 20. Aligning the Scanning Beam: Cutter Installed

Scanning Beam

183466a

Ⓐ

From Figure 20 on
page 35.

Notch in the Upper
Enclosure Cutter
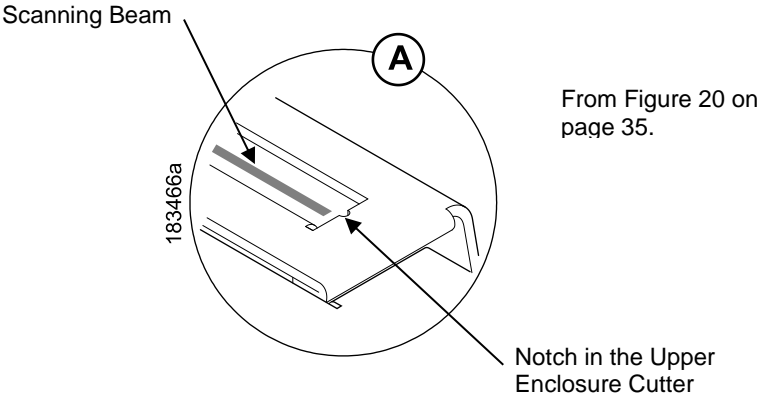
Figure 21. Scanning Beam Location: Cutter Installed

M4 x 6 mm
Screw

NOTE: Only needed if laser beam skew adjustment is required.

Pivot Screw

NOTE: Loosen all four screws to adjust the beam forward or back
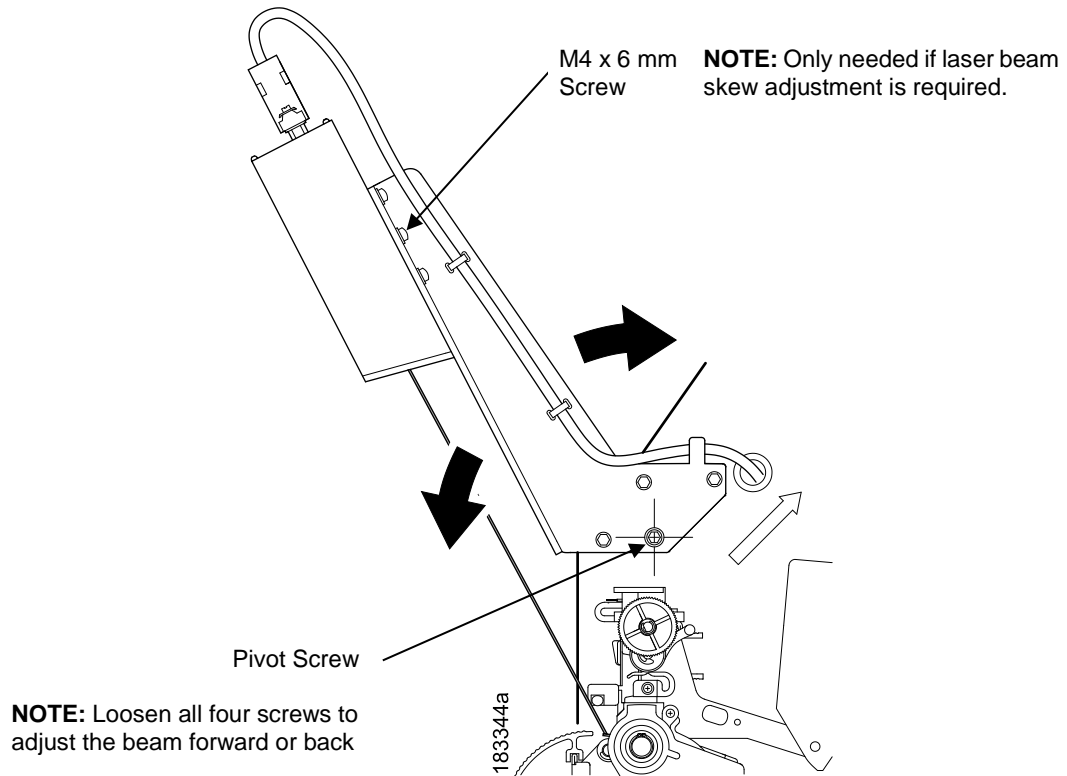
183344a

Figure 22. Scanning Beam Adjustment Screws

Figure 22 shows the screws used to adjust the position of the scanning beam. The positions of the screws assume that you are in front of the validator unit and facing the printer. The following instructions and illustrations show how to adjust the validator according to how the beam appears.

1. Power the printer on and make sure the scanning beam is on. If the beam is off, press the **RESET** button for less than 2 seconds to turn on the scanning beam.

2. Use the hex key provided to adjust the screws.

3. Loosen the four screws so the validator/bracket unit can be rotated about the pivot screw.
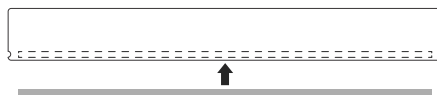
Scanning Beam Vertical Alignment

Tear Bar

Correct vertical alignment of the scanning beam. The beam lines up with the end notches and is parallel to the long edge of the tear bar.
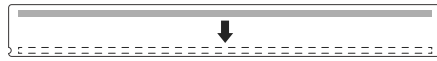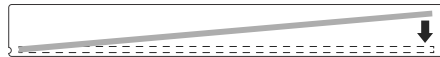
Raise the validator/bracket unit to move the scanning beam forward. Once the beam is correctly aligned with the end notches, tighten the four screws.

Lower the validator/bracket unit to move the scanning beam back. Once the beam is correctly aligned with the end notches, tighten the four screws.

Scanning Beam Skew Adjustment

Install the M4 x 6 mm screw in the right threaded (outboard) hole and use the 3 mm allen wrench to gradually turn the screw clockwise until the beam is parallel.
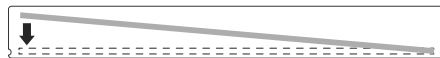
Install the M4 x 6 mm screw in the left threaded hole and use the 3 mm allen wrench to gradually turn the screw clockwise until the beam is parallel.

Shifting the Scanning Beam

This option enables you to shift the scanning beam horizontally to the left or right. The left edge of the beam should be approximately 0.25 inches (6.35 mm) past the left edge of the tear bar or the upper enclosure of a cutter assembly. 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 is 0. Lower values will move the beam to the left.

NOTE: You must set Admin User to Enable (in the PRINTER CONTROL menu) to access the Beam Shift option.
(Refer to the *Administrator's Manual*.)

1. Press ⁝≡ to take the printer offline and place the printer in Menu mode.

2. If necessary, press ↓ and ↵ at the same time to unlock the ↵ key.

3. Press ⁝≡ until VALIDATOR displays.

4. Press ↓ until Validator Funct. displays.

5. Make sure Enable is selected.

6. Press ↑ until Beam Shift displays.

7. Press **+** or **–** to scroll through the values: –99 to 99. The default is 0. Lower values will move the beam to the left. Press ↵ to accept the shift value.

   Keep selecting the new value until the beam width is at the desired position. The left edge of beam should be approximately 0.25 inches (6.35 mm) past the left edge of the tear bar or the upper enclosure of a cutter assembly.

8. Save the configuration for future use. (Refer to Saving A Configuration in the *Administrator's Manual*.)

Calibration

WARNING	**Class 2 laser light. Do not stare into the laser beam or a reflected image of the laser beam.**
WARNING	**Using controls, making adjustments, or performing procedures other than those specified herein may result in hazardous radiation exposure.**

The validator should be calibrated when it is first installed or when the printer displays Calibration warning. A special calibration bar code card is included with the validator package.

1. Make sure the printer is powered on and in offline mode, and that the validator power light and scanning beam are on. If the beam is off, press the RESET button for less than 2 seconds to turn on the beam.

NOTE: In SL5/T5R Energy Star models, the Power Save mode powers the validator off. Press the FEED key to restore power and turn on the beam within 21 seconds.

Table 2. RESET Button Settings

Time RESET Button Is Depressed	Result
Less than 2 seconds	Turns on the scanning beam
More than 4 but less than 6 seconds	Validator goes into calibration mode
More than 6 seconds	Resets validator to the last good calibration settings and turns off the scanning beam

2. If the printer has the cutter option, put the cutter in the open (down) position.

3. Remove the calibration bar code card from its protective sleeve and slide the top edge between the printhead and platen and under the scanning beam. (Figure 23.)

NOTE: Do not unlock the deck lock lever.

4. Make sure the bar code is under the scanning beam.

5. Press and hold the **RESET** button on the validator for 4 to 6 seconds until the READ light illuminates and the CALIBRATION light begins flashing.
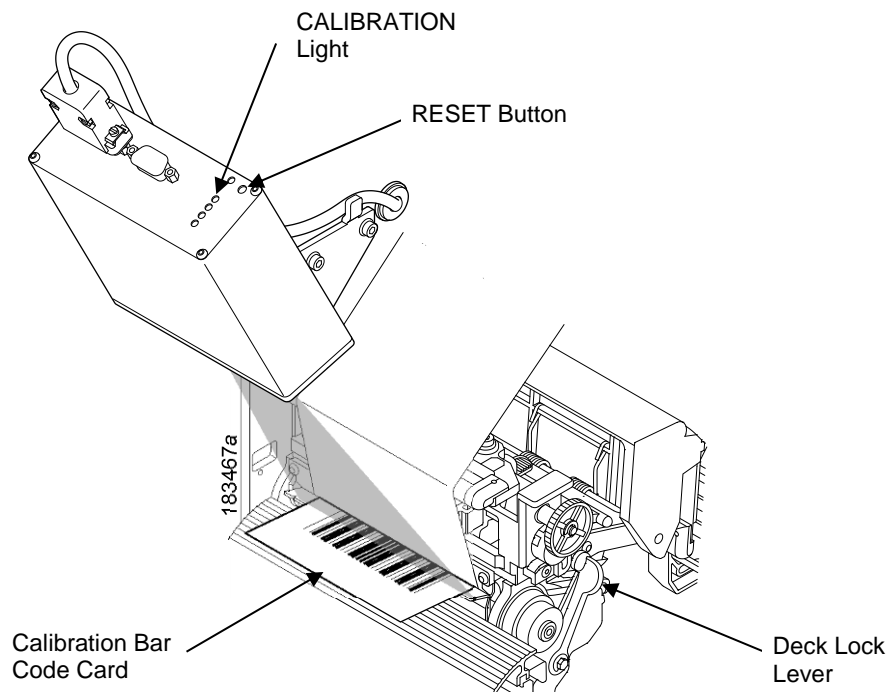
CALIBRATION Light

RESET Button

183467a

Calibration Bar Code Card

Deck Lock Lever

Figure 23. Calibrating the Validator

6. Within a few seconds the CALIBRATION and READ light will turn off. This indicates a successful calibration.

NOTE: If the calibration light is still on or flashing, the calibration has failed. In this case, refer to Table 2 on page 40 to repeat the calibration procedure or to reset the validator settings back to the last good calibration settings.

7. Once you have a successful calibration, remove the calibration bar code card.

8. Power the printer off, wait a few seconds, then power the printer on.

If the calibration was successful, the scanning beam is on and the CALIBRATION light is off. If the calibration was not successful, the scanning beam remains on and the CALIBRATION light stays lit without flashing. Repeat the calibration procedure. If repeated attempts fail, check the room for excessive ambient light, including direct sunlight. You may need to move the printer to a darker area of the room.

NOTE: In some cases the validator can detect and indicate to the printer that calibration is required. See "Calibration warning" in Table 6 on page 79.

Bar Code Validation Demo Page

The bar code validation demo page allows you to test or demonstrate the validator operation without a host computer. This page contains some text and two good bar code symbologies: one in Code 39, the other in Code 128. (Min. label size 2" W x 1" L)

NOTE: In the QUICK SETUP or MEDIA CONTROL menu, if Label Length is set between 0.5 and 1.0 inches, only the Code 128 bar code will print.

If Label Length is less than 0.5 inches or Label Width is less than 2.0 inches, no demo page will print.

To print and validate the bar code validation demo page:

1. Load the factory default configuration. (Refer to the *Administrator's Manual*.)

2. In the VALIDATOR menu, set Validator Funct. to Enable.

3. In the CALIBRATE CTRL menu, set Gap/Mark Sensing to Gap.

4. Load media.

5. In the CALIBRATE CTRL menu, run Auto Calibrate for proper gap sensing.

6. The printer must be offline. If the printer is in Menu mode, 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** until Barcode Demo displays.

8. Press the ↵ key to print and validate the demo page. (If the ↵ key is locked, unlock it by pressing ↓ and ↵ at the same time.)

9. The printer will print one demo page.

10. To demonstrate a 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 in the VALIDATOR menu is Retry Form. Using the factory default settings, the printer will pull the label with the bad barcode back, overstrike the entire label, reprint the barcodes on the next label and then stop.

11. Press **PAUSE** to take the printer offline.

12. Press ↓ and ↵ at the same time to lock the ↵ key, then press **PAUSE** to place the printer back online.

2 *Operation*

Basic Validator Setup

Unit Positioning

The validator must be positioned so that the scanning beam covers the entire area containing the bar codes, including the area required for quiet zones. The beam width can be moved horizontally to the left or right (see "Shifting the Scanning Beam" on page 39).

If a bar code is completely outside of the scanning area, straddles an edge, or does not pass completely under the scanning beam, the validator interprets it as a missing bar code and generates error conditions.

Validator Front Panel

The front panel of the validator has the following controls and indicators:

- **POWER:** Indicates the validator is at full power.
- **CALIBRATION:** Flashes when the validator is in calibration mode. See page 40 for calibration instructions.
- **READ:** Flashes when the validator is reading a bar code.
- **1** and **2:** Used for maintenance purposes only.
- **RESET:** This button has three functions, depending on how long you hold the button down. See Table 3 on page 43.

Table 3. RESET Button Settings

Time RESET Button Is Depressed	Result
Less than 2 seconds	Turns on the scanning beam
More than 4 but less than 6 seconds	Validator goes into calibration mode
More than 6 seconds	Resets validator to the last good calibration settings and turns off the scanning beam

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

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

VALIDATOR Menu

VALIDATOR

Validator Funct.
page 48 — Enable* — Disable

Auto Report
page 49 — Disable* — Enable

Auto Report Time
page 49 — 1 second* — 1 to 10 seconds

Clear Data
page 50

Good Barcodes [1]
page 51

Good Forms [1]
page 52

Overstrike Forms [1]
page 52

Average BWD [1]
page 52

Last BWD [1]
page 52

Telemetry Path
page 50 — Disabled* — Network Port

Telemetry Data
page 51 — Short Report* — Full Report — Validation Mode

Number of Codes
page 52 — Auto* — 1 to 99

Validator Action
page 75 — Retry Form* — Stop & Retry — Grade&Report — Rescan Form
— Rescan&Retry — Rescan&Stop — Stop — Overstrike

Quiet Zones
page 52 — Enable* — Disable

Notes:
*= Default
Italicized items appear
only when Admin User is
set to Enable (in the
PRINTER CONTROL
menu).
[1] Display item only

VALIDATOR
(cont. from previous page)

Min. Code Height
page 72 — 0.30 inches* — 0.13 to 1.00 inches

Min. Code Gap
page 73 — 0.30 inches* — 0.15 to 1.00 inches

Skip Labels
page 53 — Minimum* — Maximum

F/W Revision
page 53 — Version: xxxx [1]

Overstrike Style
page 54 — Grid* — Grey — Checkerboard — Error Type Msg

12of5 Checksum
page 54 — Disable* — Enable

Num Retry
page 55 — 5* — 3 — 4

Num Rescan
page 55 — 1* — 1 to 5

Max Retry Action
page 55 — Dump Form* — Keep Form

Label Save
page 55 — *Disable** — *Enable*

Decodeability
page 56 — *37%* — *30% to 90%*

Percent Decode
page 56 — *0%* — *0% to 99%*

Defects
page 56 — *21%* — *0% to 100%*

Overall Grade
page 57 — *0.0** — *0.0 to 4.0*

(cont. on next page)

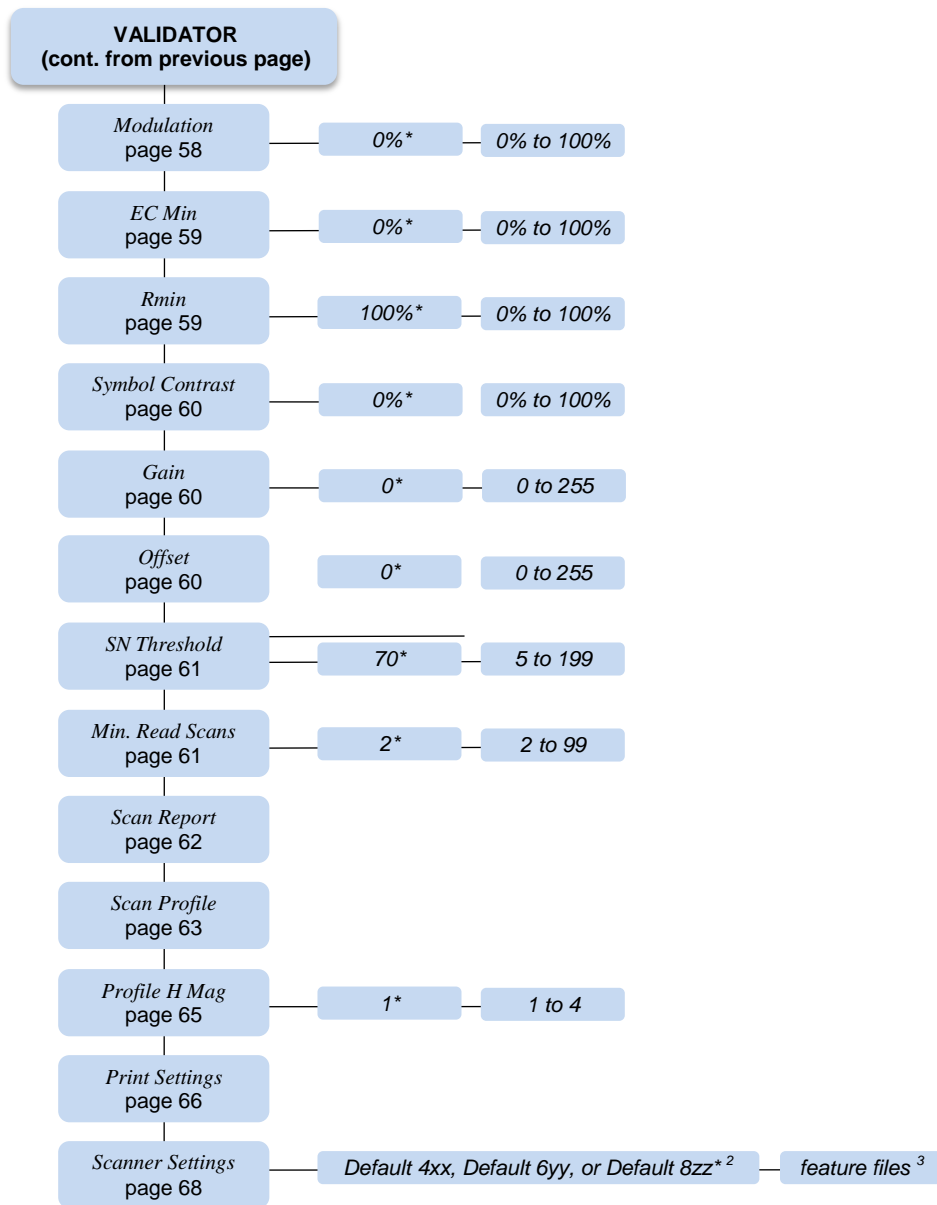Notes:
*= Default
Italicized items appear
only when Admin User is
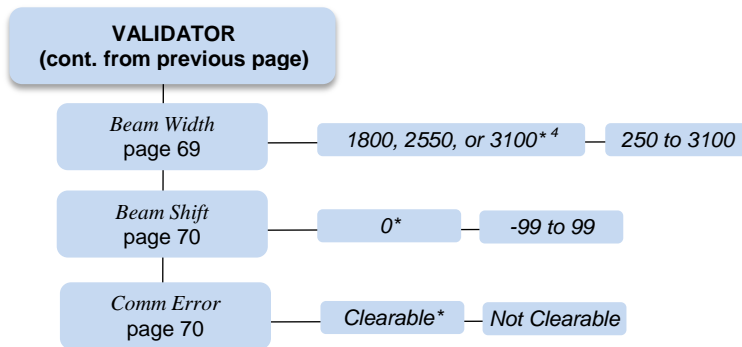set to Enable (in the
PRINTER CONTROL
menu).
[1] Display item only

**VALIDATOR
(cont. from previous page)**

| *Modulation* page 58 | 0%* | 0% to 100% |

| *EC Min* page 59 | 0%* | 0% to 100% |

| *Rmin* page 59 | 100%* | 0% to 100% |

| *Symbol Contrast* page 60 | 0%* | 0% to 100% |

| *Gain* page 60 | 0* | 0 to 255 |

| *Offset* page 60 | 0* | 0 to 255 |

| *SN Threshold* page 61 | 70* | 5 to 199 |

| *Min. Read Scans* page 61 | 2* | 2 to 99 |

| *Scan Report* page 62 | | |

| *Scan Profile* page 63 | | |

| *Profile H Mag* page 65 | 1* | 1 to 4 |

| *Print Settings* page 66 | | |

| *Scanner Settings* page 68 | *Default 4xx, Default 6yy, or Default 8zz*[2] | *feature files* [3] |

Notes:
*= Default
Italicized items appear only when Admin User is set to Enable (in the PRINTER CONTROL menu).
[2] Depends on the printer model: 4, 6, and 8 inch printers respectively. xx, yy, zz = file revision numbers.
[3] Appears only if feature files have been downloaded to the printer. Up to seven files can appear.
[4] Depends on the printer model: 4, 6, and 8 inch printers respectively.

```
┌─────────────────────────────┐
│          VALIDATOR          │
│   (cont. from previous page)│
└─────────────────────────────┘
              │
   ┌──────────────────┐
   │   Beam Width     │──────── 1800, 2550, or 3100* 4 ── 250 to 3100
   │    page 69       │
   └──────────────────┘
              │
   ┌──────────────────┐
   │   Beam Shift     │────────── 0* ────── -99 to 99
   │    page 70       │
   └──────────────────┘
              │
   ┌──────────────────┐
   │   Comm Error     │────── Clearable* ── Not Clearable
   │    page 70       │
   └──────────────────┘
```

Notes:

*= Default

Italicized items appear only when Admin User is set to Enable (in the PRINTER CONTROL menu).

[2] Depends on the printer model: 4, 6, and 8 inch printers respectively. xx, yy, zz = file revision numbers.

[3] Appears only if feature files have been downloaded to the printer. Up to seven files can appear.

[4] Depends on the printer model: 4, 6, and 8 inch printers respectively.

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.

NOTE: If you make any changes to the default configuration menu items, you will be prompted to save the configuration.
See "Auto Save Configuration" in the *Administrator's Manual*.

Enabling and Disabling the Validator

Software can automatically detect an installed validator when the printer is powered up. If the printer is powered up with Power-Up Config. set to Factory, the VALIDATOR menu will be available and Validator Funct. is set to Enable in the QUICK SETUP and VALIDATOR menus.

If Power-Up Config. is not set to Factory, the VALIDATOR menu will be available, but Validator Funct. is set to Disable. Enable Validator Funct. by completing the following steps. (This is a one-time setting once you save the configuration.)

IMPORTANT   **Do not disable or enable the validator with data in the buffer. See "Resetting Validator Data" on page 50.**

1.   Press ⌗ to take the printer offline and place the printer in Menu mode.

2.   If necessary, press ↓ and ↵ at the same time to unlock the ↵ key.

3.   Press ⌗ until VALIDATOR displays.

4.   Press ↓ until Validator Funct. displays.

5.   Press **+** or **–** until Enable displays.

6.   Press ↵ to enable the validator. An asterisk (*) should appear after Enable. Once enabled, the printer will command the validator to begin scanning and reporting errors, and the counters will be incremented.

7.   Press ↓ and ↵ at the same time to lock the ↵ key, then press **PAUSE** to take the printer offline.

8.   Press **PAUSE** again to put the printer online.

NOTE: To disable the validator once it has been enabled, repeat step 1 through 8 and select Disable in step 5.

RFID Encoder

If you have an RFID encoder but are not encoding RFID tags, make sure RFID Reader is set to Disable (in the RFID CONTROL menu), otherwise the validation process will slow down considerably as the RFID encoder attempts to scan for non-existent RFID tags.

Validator Reporting

After any completed print job or Bar Code Demo page, 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 50).

Requesting a Validator Report

This procedure prints a summarized validator report. (This report also includes RFID data if the printer has an RFID encoder.)

1. Press the **PAUSE** key to take the printer offline.

2. If necessary, press ↓ and ↵ at the same time to unlock the ↵ key.

3. Press **TEST PRINT**. Printer Tests displays.

4. Press **+** until RFID/ODV Report displays.

5. Press ↵ to print the report.

6. Press ↓ and ↵ at the same time to lock the ↵ key, then press **PAUSE** to take the printer offline.

7. Press **PAUSE** again to put the printer online.

Setting Auto Report

This function allows you to disable or enable an automatic validator report printout after a batch job or Bar Code Demo page. The default is Disable.

You can determine the end of a batch job in two ways:

- by using an Execute command, or
- by enabling the Auto Report Time (see below).

To enable Auto Report:

1. Press ⋮≡ to take the printer offline and place the printer in Menu mode.

2. If necessary, press ↓ and ↵ at the same time to unlock the ↵ key.

3. Press ⋮≡ until VALIDATOR displays.

4. Press ↓ until Auto Report displays.

5. Press **+** or **–** to scroll through the choices: Enable or Disable. The default is Disable.

6. When Enable displays, press ↵ to activate Auto Report.

7. Press ↓ and ↵ at the same time to lock the ↵ key, then press **PAUSE** to take the printer offline.

8. Press **PAUSE** again to put the printer online.

Setting Auto Report Time

This function allows you to set, in seconds, the timeout for the Auto Report. If the printer is idle for the set number of seconds, an Auto Report will be generated if Auto Report is set to Enable (see "Setting Auto Report" on page 49.) The default is 1 second.

To set the Auto Report Time:

1. Press ⋮≡ to take the printer offline and place the printer in Menu mode.

2. If necessary, press ↓ and ↵ at the same time to unlock the ↵ key.

3. Press ⋮≡ until VALIDATOR displays.

4. Press ↓ until Auto Report Time displays.

5. Press **+** or **–** to scroll through the choices: 1 to 10 seconds. The default is 1 second.

6. When the desired number of seconds displays, press ↵ to set the Auto Report Time.

7. Press ↓ and ↵ at the same time to lock the ↵ key, then press **PAUSE** to take the printer offline.

8. Press **PAUSE** again to put the printer online.

Resetting Validator Data

The validator reports on all bar codes it detects since the last data reset. For example, 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. Press ⋮≡ to take the printer offline and place the printer in Menu mode.

2. If necessary, press ↓ and ↵ at the same time to unlock the ↵ key.

3. Press ⋮≡ until VALIDATOR displays.

4. Press ↓ until Clear Data displays.

5. Press ↵ to clear validator data.

6. Press ↓ and ↵ at the same time to lock the ↵ key, then press **PAUSE** to take the printer offline.

7. Press **PAUSE** again to put the printer 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. The default is Disabled. Follow the procedure below to select the data output destination.

1. Press ⋮≡ to take the printer offline and place the printer in Menu mode.

2. If necessary, press ↓ and ↵ at the same time to unlock the ↵ key.

3. Press ⋮≡ until VALIDATOR displays.

4. Press ↓ until Telemetry Path displays.

5. Press **+** or **–** to cycle through the choices:

   • **Disabled.** Default setting. The validator does not send any data to an external device.

- **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 optional remote management software.

6. When your selection displays, press ↵ to activate it. All future reports are output to your selection.

7. Press ↓ and ↵ at the same time to lock the ↵ key, then press **PAUSE** to take the printer offline.

8. Press **PAUSE** again to put the printer 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 Report and Validation Mode.

1. Press ⋮☰ to take the printer offline and place the printer in Menu mode.

2. If necessary, press ↓ and ↵ at the same time to unlock the ↵ key.

3. Press ⋮☰ until VALIDATOR displays.

4. Press ↓ until Telemetry Data displays.

5. Press **+** or **–** 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.

   - **Validation Mode.** Provides the same data as the Short Report, but adds the actual bar code data read.

6. When your selection displays, press ↵ to activate it.

7. Press ↓ and ↵ at the same time to lock the ↵ key, then press **PAUSE** to take the printer offline.

8. Press **PAUSE** again to put the printer 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. Press ⋮☰ to take the printer offline and place the printer in Menu mode.

2. If necessary, press ↓ and ↵ at the same time to unlock the ↵ key.

3. Press ⋮☰ until VALIDATOR displays.

4. Press ↓ to scroll through the following statistics on the printer display:

   - **Good Barcodes:** The number of bar code reports sent from the validator since the last Clear Data command.

- **Good Forms:** The number of good (non-overstruck) forms printed since the last Clear Data command.

- **Overstrike 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%.

5. Press ↓ and ↵ at the same time to lock the ↵ key, then press **PAUSE** to take the printer offline.

6. Press **PAUSE** again to put the printer 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 bitmapped 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 assumes a gross bar code failure.

When Auto (the default) 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. Press ⁝☰ to take the printer offline and place the printer in Menu mode.

2. If necessary, press ↓ and ↵ at the same time to unlock the ↵ key.

3. Press ⁝☰ until VALIDATOR displays.

4. Press ↓ until Number of Codes displays.

5. Press **+** or **–** to scroll through the choices: Auto, 1 to 99. The default is Auto.

6. Press ↵ to select the desired value.

7. Press ↓ and ↵ at the same time to lock the ↵ key, then press **PAUSE** to take the printer offline.

8. Press **PAUSE** again to put the printer online.

Checking Quiet Zones

Quiet zones are the white spaces 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 set to Enable (the default), then the bar code quiet zone is included as part of the pass/fail criteria.

1. Press ☷ to take the printer offline and place the printer in Menu mode.

2. If necessary, press ↓ and ↵ at the same time to unlock the ↵ key.

3. Press ☷ until VALIDATOR displays.

4. Press ↓ until Quiet Zones displays.

5. Press + or – to scroll through the choices: Enable or Disable. The default is Enable.

6. Press ↵ to select the desired value.

7. Press ↓ and ↵ at the same time to lock the ↵ key, then press **PAUSE** to take the printer offline.

8. Press **PAUSE** again to put the printer online.

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

Checking the Firmware Revision Number

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

1. Press ☷ to take the printer offline and place the printer in Menu mode.

2. If necessary, press ↓ and ↵ at the same time to unlock the ↵ key.

3. Press ☷ until VALIDATOR displays.

4. Press ↓ until F/W Revision displays. The firmware revision number displays.

5. Press ↓ and ↵ at the same time to lock the ↵ key, then press **PAUSE** to take the printer offline.

6. Press **PAUSE** again to put the printer online.

Setting for Skip Labels

This option is used for skipping blank labels after bad labels have been marked. It is useful when you want to have extra blank labels in between bad and good ones. The settings are Minimum (the default) and Maximum. Minimum allows up to one blank label, and Maximum allows up to two blank labels.

NOTE: Minimum and Maximum blank labels are only applicable for forms 2 inches (5.08 cm) high or more. For labels less than 2 inches high, the minimum and maximum blank labels may vary.

1. Press ☷ to take the printer offline and place the printer in Menu mode.

2. If necessary, press ↓ and ↵ at the same time to unlock the ↵ key.

3. Press ☷ until VALIDATOR displays.

4. Press ↓ until Skip Labels displays.

5. Press **+** or **–** to scroll through the choices: Minimum or Maximum. The default is Minimum.

6. Press ↵ to select the desired value.

7. Press ↓ and ↵ at the same time to lock the ↵ key, then press **PAUSE** to take the printer offline.

8. Press **PAUSE** again to put the printer online.

Setting Overstrike Style

This option is used for marking bad labels with different overstrike styles: Grid (the default), Grey, Checkerboard, or Error Type Msg.

IMPORTANT   **If you are using an RFID encoder, set the validator Overstrike Style different than the RFID Overstrike Style (in the RFID CONTROL menu). This will help you differentiate between a validator error and an RFID error.**

1. Press ⁞☰ to take the printer offline and place the printer in Menu mode.

2. If necessary, press ↓ and ↵ at the same time to unlock the ↵ key.

3. Press ⁞☰ until VALIDATOR displays.

4. Press ↓ until Overstrike Style displays.

5. Press **+** or **–** to scroll through the choices: Grid, Grey, Checkerboard, or Error Type Msg. The default is Grid.

6. Press ↵ to select the desired value.

7. Press ↓ and ↵ at the same time to lock the ↵ key, then press **PAUSE** to take the printer offline.

8. Press **PAUSE** again to put the printer online.

Setting I2of5 Checksum

This option allows you to include or exclude the checksum option in the Interleaved 2 of 5 code as part of the grading. For example, if you enable this option, then any incoming bar code data without checksum digits will be graded as a failure, and a Checksum Failure error will display. The default is Disable.

1. Press ⁞☰ to take the printer offline and place the printer in Menu mode.

2. If necessary, press ↓ and ↵ at the same time to unlock the ↵ key.

3. Press ⁞☰ until VALIDATOR displays.

4. Press ↓ until I2of5 Checksum displays.

5. Press **+** or **–** to scroll through the options: Enable or Disable. The default is Disable.

6. Press ↵ to accept the desired value.

7. Press ↓ and ↵ at the same time to lock the ↵ key, then press **PAUSE** to take the printer offline.

8. Press **PAUSE** again to put the printer online.

Num Retry

This option allows you to set the number of times a form will be reprinted before the printer stops. After you clear the error message, the printer will print the same form or the next form, depending on the setting for Max Retry Action (see "Max Retry Action" below).

The options are 3, 4, and 5. The default is 5.

NOTE: This setting is utilized only when Validator Action is set to Retry Form, Stop & Retry, or Rescan&Retry. See "Validator Action (Error Action)" on page 75.

Num Rescan

This option allows you to set the number of times a form will be rescanned before the printer stops. After you clear the error message, the printer will print the same label or the next label, depending on the setting for Max Retry Action (see "Max Retry Action" below).

The options are 1 to 5. The default is 1.

NOTE: This setting is utilized only when Validator Action is set to Rescan, Rescan&Retry, or Rescan&Stop. See "Validator Action (Error Action)" on page 75.

Max Retry Action

This option determines what the printer will do with the current form once the Num Retry or Num Rescan counter has been exhausted (see "Num Retry" or "Num Rescan" above).

If Max Retry Action is set to Dump Form, after you clear the fault the form will be dumped and printing will resume with the next form.

If Max Retry Action is set to Keep Form, after you clear the fault printing will resume with the same form again. It will not attempt to print the next form until the problem form has printed correctly.

NOTE: This setting is utilized only when Validator Action is set to Retry Form, Stop & Retry, Rescan Form, Rescan&Retry, or Rescan&Stop. See "Validator Action (Error Action)" on page 75.

Advanced Validator Options

The following items are considered advanced items and are only visible if Admin User is set to Enable (in the PRINTER CONTROL menu). Refer to the configuration section of your *Administrator's Manual* for more information.

Label Save

The printer will often be printing a label when it determines that the label printed before the immediate label was defective. When set to disable, the printer pulls both labels back, overstrikes them and then reprints them. With Label Save enabled, the ODV will accept or reject the label it just printed before it prints the next label. Label Save enabled causes a slight throughput reduction; when a label is found defective, it will only overstrike that label. The default is disable.

Decodeability

NOTE: This parameter factors into the Overall Grade (page 57).

You can determine how strict the validator grades the wide/narrow bars and spaces which compose the bar code by setting the Decodeability parameter to a percentage value from 30% to 90%. The higher the percentage value chosen, the stricter the validator grades. The default is 37%.

For example, if the Decodeability value is set to 37%, the validator gives the bar code a failing grade if the decodeability of the bar code is at or below 37%.

1. Press ⠿ to take the printer offline and place the printer in Menu mode.

2. If necessary, press ↓ and ↵ at the same time to unlock the ↵ key.

3. Press ⠿ until VALIDATOR displays.

4. Press ↑ until Decodeability displays.

5. Press + or – to scroll through the percentage values: 30% to 90%. The default is 37%.

6. Press ↵ to select the desired value.

7. Press ↓ and ↵ at the same time to lock the ↵ key, then press **PAUSE** to take the printer offline.

8. Press **PAUSE** again to put the printer online.

Percent Decode

NOTE: This parameter factors into the Overall Grade (page 57).

You can set how strict the validator grades each bar code. For example, setting Percent Decode to 60% 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 from 0% to 99%. The higher the percentage value chosen, the stricter the validator grades.

1. Press ⠿ to take the printer offline and place the printer in Menu mode.

2. If necessary, press ↓ and ↵ at the same time to unlock the ↵ key.

3. Press ⠿ until VALIDATOR displays.

4. Press ↑ until Percent Decode displays.

5. Press + or – to scroll through the percentage values: 0% to 90%. The default is 0%.

6. Press ↵ to select the desired value.

7. Press ↓ and ↵ at the same time to lock the ↵ key, then press **PAUSE** to take the printer offline.

8. Press **PAUSE** again to put the printer online.

Defects

NOTE: This parameter factors into the Overall Grade (page 57).

You can set how strict the validator grades the irregularities such as voids and spots found within elements and quiet zones for each bar code. For example, the Defects default is 21%. This means that if the bar code and quiet zone defects exceed 21%, the

validator gives the bar code a failing grade. You can set the Defects parameter to a percentage value from 0% to 100%. The lower the percentage value chosen, the stricter the validator grades.

1. Press ⋮☰ to take the printer offline and place the printer in Menu mode.

2. If necessary, press ↓ and ↵ at the same time to unlock the ↵ key.

3. Press ⋮☰ until VALIDATOR displays.

4. Press ↑ until Defects displays.

5. Press + or – to scroll through the percentage values: 0% to 100%. The default is 21%.

6. Press ↵ to select the desired value.

7. Press ↓ and ↵ at the same time to lock the ↵ key, then press **PAUSE** to take the printer offline.

8. Press **PAUSE** again to put the printer online.

Overall Grade

This menu item sets the value used by the validator for pass/fail threshold during the analysis of bar codes. Instead of a letter grade, numbers are used to allow for more resolution. The numbers can be translated to letter grades according to the 4.0 grade table below.

Table 4. Grading Scale for Overall Grade

Letter Grade	Grade Numerical Range
A	3.5 to 4.0
B	2.5 to 3.4
C	1.5 to 2.4
D	0.5 to 1.4
F	0.0 to 0.4

Any bar code with a grade below this threshold value will cause the printer to display the Overall Grade Fail error message (see "Error Messages" on page 79) and take the appropriate error action. Higher values create a stricter pass criterion.

The Overall Grade is determined by taking the lowest grade obtained for any of these bar code quality parameters: Decodeability, Percent Decode, Defects, Modulation, EC Min, Rmin, and Symbol Contrast.

You can set the Overall Grade parameter to a value from 0.0 to 4.0. The default is 0.0.

Overall Grade Calculations

The validator follows the specified algorithm defined in the ANSI X3.182 specification for determining the Overall Grade based on an average. Although it is not defined, the validator truncates the result of all analysis parameters averages for a slightly stricter grading.

A side effect of the ANSI specified algorithm is that the Overall Grade may be lower than any of the averaged analysis parameters. This occurs because the Overall Grade is

based on the lowest grade on any scan converted to a single digit grade (A to F, 4 to 0) which is then averaged. This usually occurs when a single analysis parameter has a value just above or just below the Overall Grade.

Example

The Decodeability value of 51 displays as B, but the Overall Grade displays as C.

The bar code was scanned five times: three scans had values of 0.49 (grade C) and two scans had values of 0.54 (grade B).

> The Decodeability grading calculation is:
> (3 x 0.49) + (2 x 0.54) = 2.55
> 2.55 ÷ 5 = 0.51 (grade B)

> The Overall Grade calculation is:
> (3 x 2.0) + (2 x 3.0) = 12
> 12 ÷ 5 = 2.4 (grade C)

Also, with certain combinations of multiple analysis parameters and possibly the truncation used on the analysis parameter's average, the Overall Grade may be higher than an individual analysis parameter grade.

Example

The Decodeability value of 48 displays as C, but the Overall Grade displays as B.

The bar code was scanned five times: four scans had values of 0.51 (grade B) and one scan had a value of 0.40 (grade C).

> The Decodeability grading calculation is:
> (4 x 0.51) + (1 x 0.40) = 2.44
> 2.44 ÷ 5 = .49 (grade C)

> The Overall Grade calculation is:
> (4 x 3.0) + (1 x 2.0) = 14
> 14 ÷ 5 = 2.8 (grade B)

Modulation

NOTE: This parameter factors into the Overall Grade (page 57).

Modulation measures how well the scan laser sees the wide elements (bars or spaces) relative to the narrow elements. In general, scanning lasers see bars better than spaces and wide elements better than the narrow elements. This menu item sets the value used by the validator for pass/fail threshold during the analysis of bar codes. Higher values create a stricter criterion for passing.

You can set the Modulation parameter to a percentage value from 0% to 100%. The default is 0%.

1. Press ⌗ to take the printer offline and place the printer in Menu mode.

2. If necessary, press ↓ and ↵ at the same time to unlock the ↵ key.

3. Press ⌗ until VALIDATOR displays.

4. Press ↑ until Modulation displays.

5. Press + or – to scroll through the percentage values: 0% to 100%. The default is 0%.

6. Press ↵ to select the desired value.

7. Press ↓ and ↵ at the same time to lock the ↵ key, then press **PAUSE** to take the printer offline.

8. Press **PAUSE** again to put the printer online.

EC Min

NOTE: This parameter factors into the Overall Grade (page 57). The higher the value, the stricter the criterion for passing.

This menu item sets the minimum edge contrast, which is the worst edge transition (bar to space or space to bar) used by the validator for pass/fail threshold during the analysis of bar codes. Bar codes with an edge contrast below this threshold will fail.

You can set the EC Min parameter to a percentage value from 0% to 100%. The default is 0%.

1. Press ⋮≡ to take the printer offline and place the printer in Menu mode.

2. If necessary, press ↓ and ↵ at the same time to unlock the ↵ key.

3. Press ⋮≡ until VALIDATOR displays.

4. Press ↑ until EC Min displays.

5. Press + or – to scroll through the percentage values: 0% to 100%. The default is 0%.

6. Press ↵ to select the desired value.

7. Press ↓ and ↵ at the same time to lock the ↵ key, then press **PAUSE** to take the printer offline.

8. Press **PAUSE** again to put the printer online.

Rmin

NOTE: This parameter factors into the Overall Grade (page 57).

This menu item sets the minimum reflectance value used by the validator for pass/fail threshold used during the analysis of bar codes. A bar code will fail if all the bar reflectance values are above the percentage of space reflectance set by this threshold. For example, an Rmin setting of 50% requires that at least one bar reflectance value fall under the mid point of the reflectance value read for the highest space reflectance.

You can set the Rmin parameter to a percentage value from 0% to 100%. The default is 100%.

1. Press ⋮≡ to take the printer offline and place the printer in Menu mode.

2. If necessary, press ↓ and ↵ at the same time to unlock the ↵ key.

3. Press ⋮≡ until VALIDATOR displays.

4. Press ↑ until Rmin displays.

5. Press + or – to scroll through the percentage values: 0% to 100%. The default is 100%.

6. Press ↵ to select the desired value.

7. Press ↓ and ↵ at the same time to lock the ↵ key, then press **PAUSE** to take the printer offline.

8. Press **PAUSE** again to put the printer online.

Symbol Contrast

NOTE: This parameter factors into the Overall Grade (page 57). The higher the value, the stricter the criterion for passing.

Symbol Contrast represents the contrast between the bars and spaces in the bar code used by the validator for pass/fail threshold used during the analysis of bar codes. The bar code must have a certain level of contrast to be recognized by the validator. Bar codes with a symbol contrast below the threshold will fail.

You can set the Symbol Contrast parameter to a percentage value from 0% to 100%. The default is 0%.

NOTE: To disable this parameter, set Symbol Contrast to 0%.

1. Press ⁞☰ to take the printer offline and place the printer in Menu mode.

2. If necessary, press ↓ and ↵ at the same time to unlock the ↵ key.

3. Press ⁞☰ until VALIDATOR displays.

4. Press ↑ until Symbol Contrast displays.

5. Press + or – to scroll through the percentage values: 0% to 100%. The default is 0%.

6. Press ↵ to select the desired value.

7. Press ↓ and ↵ at the same time to lock the ↵ key, then press **PAUSE** to take the printer offline.

8. Press **PAUSE** again to put the printer online.

Gain

This menu item sets the scanner gain setting (when a non zero value is set). This allows you to adjust the amplitude (height) of the space/bar transitions as seen on a Scan Profile to optimize the validator hardware for applications where standard settings make the bar codes unreadable. The range is from 0 to 255.

NOTE: If you want the validator to automatically adjust its Gain setting during a validator calibration, set Gain = 0 and Offset = 0. Gain and Offset are automatically adjusted during calibration only if both Gain = 0 and Offset = 0.

Offset

This menu item sets the scanner offset setting (when a non zero value is set). This allows you to adjust the vertical position of the Scan Profile to guarantee that the validator hardware is reading the bar codes within the optimal range. You can adjust this to place the bar code profile in the center of the profile scale above 10% and below 90%. The range is from 0 to 255.

NOTE: If you want the validator to automatically adjust its Offset setting during a validator calibration, set Offset = 0 and Gain = 0. Offset and Gain are automatically adjusted during calibration only if both Offset = 0 and Gain = 0.

SN Threshold

This menu item sets the SN (signal to noise) threshold used by the validator to discriminate between high peak noise and actual bar code transitions. Any reflectance transitions that are below the threshold are ignored and considered noise.

You can set the SN Threshold to a value from 5 to 199.
The default is 70.

1. Press ☰ to take the printer offline and place the printer in Menu mode.

2. If necessary, press ↓ and ↵ at the same time to unlock the ↵ key.

3. Press ☰ until VALIDATOR displays.

4. Press ↑ until SN Threshold displays.

5. Press **+** or **–** to scroll through the values: 5 to 199.
   The default is 70.

6. Press ↵ to select the desired value.

7. Press ↓ and ↵ at the same time to lock the ↵ key, then press **PAUSE** to take the printer offline.

8. Press **PAUSE** again to put the printer online.

Min. Read Scans

This menu item sets the minimum number of scans per bar code that must be read. If less than the minimum number is read, then the "Unscannable / xx Missing Codes" error message is generated.

To ensure that the validator accurately validates the bar codes, set the Min. Read Scans value to 75% of the number of scans possible per bar code (rounded down).

Use this formula to determine the number of scans possible per bar code in relation to print speed and bar code height:

$$\frac{100 \times \text{Bar Code Height In Inches}}{\text{Print Speed (Inches Per Second)}} = \begin{array}{c}\text{Number of Scans Possible} \\ \text{(rounded down)}\end{array}$$

Set Min. Read Scans to 75% of the Number of Scans Possible value.

IMPORTANT   **If you have more than one bar code on the form, use the shortest bar code for the calculation.**

Example

For a 0.5 inch tall bar code printing at 4 inches per second:

$$\frac{100 \times 0.5}{4} = \begin{array}{c}\text{12 Number of Scans Possible} \\ \text{(rounded down)}\end{array}$$

Set Min. Read Scans to 75% of 12, which is 9.

Scan Report

IMPROTANT **To print a Scan Report, Telemetry Data must be set to Full Report.**

This executable menu item prints a diagnostic printout of bar code analysis parameters calculated by the validator. It allows you to determine which parameter may be the cause of bar code verification failures. The report printed is based on the last Full Report received from the validator. This allows you to send a bar code print job to the printer, have the bar code scanned by the validator, and view a report of the parameters as seen by the validator.

For forms with multiple bar codes, only information from the last scanned bar code will be included in the report. To view validator parameters for all bar codes on a form, use the Online Data Validator Data Manager software.

NOTE: If the label is not wide enough, not all of the information will print.

The printed report is generated from validator reports received by the printer during printing. The report does not include information about bar codes that are placed in the validator scanning beam while the printer is idle or from print jobs that generate an "Unscannable: xx Missing Codes" error message.

The number of Total Scans and Good Scans can help you determine if the print speed is set too high and causing borderline failures by not allowing for enough scans to be done by the validator. The Scan Report is based on the last Full Report received by the validator. So if the last bar code printed is positioned close to the last inch of the form, and on-demand printing occurs to force the last bar code to be fed past the laser beam, the Total Scans and Good Scans reported will not be the same as those reported by the validator when printing at the set Print Speed (in the QUICK SETUP and MEDIA CONTROL menus). This is because the on-demand printing portion is done at a fixed print speed which may be higher or lower than the set Print Speed. For example, a bar code printed at 7 ips may yield eight Total Scans, but if printed in an on-demand printing mode it may yield 18 Total Scans.

Scan Report Information

1. "ERROR:" followed by highest priority failure message (if an error other than "Unscannable Code" occurred) or "None" if no error occurred
2. Printout of characters read from the bar code
3. Symbology Type Read (e.g. Code 39, Code 128, etc.)
4. Overall Grade (letter grade and calculated/number value)
5. X dimension (mils)
6. Decodeability (%)
7. Modulation (%)
8. Symbol Contrast (%)
9. EC (Average Edge Contrast) (%)
10. Defects (%)
11. Rmin/Rmax (reflectance min/max)
12. PCS (Print Contrast Signal)
13. Percent Decode (%)
14. Bar Deviation Avg (%)

15. Min. Bar Deviation (%)

16. Max. Bar Deviation (%)

17. Ratio

18. Good Scans

19. Total Scans

The following is a sample scan report of a Code 39, 10 mil bar code containing "*PTX8702*" with a quiet zone violation:

```
            SCAN REPORT

ERROR: Bar code quiet zone too small
Barcode Data: [ST]PTX8702[ST]
Symbology        Code 39
Overall Grade             C (2.1)
X dimension (mils)                  09.9
Decodeability (%)        65
Modulation (%)           34
Symbol Contrast (%)                 68
Edge Contrast (%)        30
Defects (%)      14
Rmin/Rmax        2
PCS              92
Percent Decode (%)                  100
Bar Deviation Avg (%)               -16
Min. Bar Deviation (%)              -31
Max. Bar Deviation (%)              -4
Ratio            2.0
Good Scans       28
Total Scans      30
```

Scan Profile

This is an executable menu that prints the scan reflectance profile of a bar code placed in the validator scanning beam.

NOTE: You will need a minimum installed label width of 2 inches to support the Scan Profile printout.

1. Press ⠿ to take the printer offline and place the printer in Menu mode.

2. If necessary, press ↓ and ↵ at the same time to unlock the ↵ key.

3. Press ⠿ until VALIDATOR displays.

4. Press ↑ until Scan Profile displays.

5. Place a bar code in the scanning beam path.

6. Press ↵ to scan the bar code.

7. When prompted on the control panel, remove the scanned bar code.

8. Press ↵ to print the scan profile.

9. Press ↓ and ↵ at the same time to lock the ↵ key, then press **PAUSE** to take the printer offline.

10. Press **PAUSE** again to put the printer online.

The length of the scan profile printed is proportional to the Beam Width setting (page 69) and depends on the Profile H Mag setting (page 65).

The scan profile will print either a 1.5 inch wide or a 3 inch wide graph depending on the Label Width setting (in the MEDIA CONTROL menu). (Label widths less than 4 inches print the smaller 1.5 inch wide profile.)

Printing is done in continuous mode without taking into account media gap/marks.

NOTE: Use continuous media or else the scan profile may distort at the media gap/marks.

The following figure shows a sample scan profile graph. It only shows the profile of actual bar code data. The dashed lines represent the 90% and 10% marks. You can use these to help set the gain and offset (if necessary).
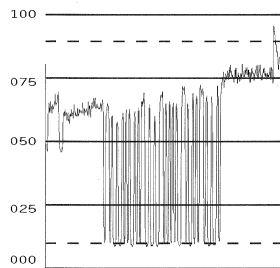

Figure 24. Sample Scan Profile

Profile H Mag

This menu item selects the horizontal magnification for printing the scan profile. This allows you to zoom in on the profile. Magnification values are multiples of the scan profile length printed for a given Beam Width setting. For example, if the Beam Width setting of 1800 prints a 4 inch scan profile, a Profile H Mag setting of 2 prints an 8 inch scan profile.

You can set the Profile H Mag parameter to a value from 1 to 4.
The default is 1.

Press ⠇☰ to take the printer offline and place the printer in Menu mode.

If necessary, press ↓ and ↵ at the same time to unlock the ↵ key.

Press ⠇☰ until VALIDATOR displays.

Press ↑ until Profile H Mag displays.

Press **+** or **–** to scroll through the values: 1 to 4. The default is 1.

Press ↵ to select the desired value.

Press ↓ and ↵ at the same time to lock the ↵ key, then press **PAUSE** to take the printer offline.

Press **PAUSE** again to put the printer online.

Figure 25 shows a Profile H Mag setting of 2 for the same scan profile shown in Figure 24, page 64 (Profile H Mag setting of 1).
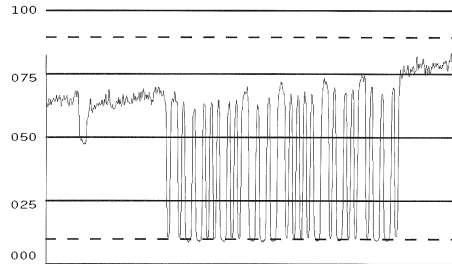

Figure 25. Sample Scan Profile: Profile H Mag = 2

Print Settings

This is an executable menu item that reads and prints the settings used by the validator.

The response received from the validator after sending the ~DV (retrieves version), ~HT (retrieves hardware settings), and ~PT8 (retrieves parameter settings) commands are printed. Use the printout to view all the active settings the validator is using and to determine if there is any invalid setting which may be causing problems.

The following is a sample printout:

```
F/W Version: X354

~HT Response:
[~HS###]SOS=  025
[~HP###]Beam  Shift=  000  024
[c]HIGHcal=  088
[c]LOWcal=  004
[~Sh##]=  088
[~Sl##]=  004
[c]SCfact=  044
[c]min  cal=  031
[~HB#]baud=  003
[~LL]smt_decode=  343
[~LM##]chars=  003
[~LN##]num_bc=  001
[~LZ##]num_bc_exact=  000
[~LR#]No_Read_Enable=000
[~LF##]I25_Mod10_Chk=000
[~HQ#]output_mode=  001
[~HO#]oper_mode=  001
[~LA##]ansi=  005
[~LS##]min_scn=  003
[~LT#]sync_in=  001
[~LP#]sync_pol=  000
[~LX#]sync_typ=  001
[~LV##]sync_md=  000
[~PO#]port_sel=  005
[PC#]port_clear_md=  000
[Pt##]port_time=  099
[~LD##]  %dec=  075
[~PR####]PRST=  000200
[~HL#]ladder_code=  000
[~HJ####]ladd_start=  0200
[~HK####]ladd_end=  4000
[~HC####]ana_len=  1800
[~HG####]ana_lenh=  0950
[~HN####]pana_len=  0950
[~HU####]freq=  400
[~HV###]GTLA_len=  199
[~HY###]snoise=  070
[~HX###]dist=  084
[~H=#]dyn_out=  000
[~H!###]zone_tol=  450
[~H@##]gt_%=  043
[~SN###]#scans=  050
[~Lp#]part=  000
[~Lt#]itfp=  000
[DACs]=  178  151  255  255
[~LQ#]p_out=  000
[~Lw,d]def=  000  000
[~L*]pnet=  000
[~LC##]I25min=  000
```

```
[~H###]NTrys=  010
[~OS#]Data_Output=  000
[~Hs#]RunSpeed=  000
[~SS######]CntlChars=013  010
[~Lm####]DataCmpr=  00  00  (Locked)
[~SW#]NetworkXmit=  000

~PT8 Response
Port  Status:
Global  HW:  001
Global  SW  MIRR:  001
PORT  STATE:  000
PASS/FAIL  PARAMETERS:
001  -  255  255
002  -  040  000
003  -  255  255
004  -  050  000
005  -  255  255
006  -  020  004
007  -  255  255
008  -  255  255
009  -  255  255
010  -  255  255
011  -  255  255
012  -  255  255
013  -  255  255
014  -  255  255
015  -  255  255
016  -  255  255
017  -  255  255
018  -  255  255
019  -  255  255
020  -  255  255
021  -  255  255
022  -  255  255
023  -  255  255
024  -  255  255
025  -  255  255
026  -  255  255
```

Scanner Settings

This option has two purposes:

- 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.
- Allows you to customize a special scanner setting for a specific application. The feature file can then be downloaded to the printer by using normal printer download procedures and must be saved as part of the power up configuration. For more information, contact the Printronix Customer Support Center. See "Contact Information" on page 89.

To set this option when a feature file has been downloaded:

1. Press ⸬≡ to take the printer offline and place the printer in Menu mode.
2. If necessary, press ↓ and ↵ at the same time to unlock the ↵ key.
3. Press ⸬≡ until VALIDATOR displays.
4. Press ↑ until Scanner Settings displays.
5. Press **+** or **–** to scroll through the options: Default or feature file 1, feature file 2, etc. (up to seven feature files). The default is Default 4xx, Default 6yy, or Default 8zz (4, 6, and 8 inch printers respectively; xx, yy, and zz are file revision numbers).
6. Press ↵ to accept the desired value.
7. Save this configuration and set it as the Power-Up configuration in the CONFIG CTRL menu.
8. Cycle power for the new setting to take effect.
9. The beam may need to be moved horizontally. See "Beam Shift" on page 70.

Beam Width

This menu item allows you to adjust the width of the scanning beam to focus on specific areas where bar codes are expected. This will reduce the amount of data the validator must process. Use this to read bar codes near text or graphics that may interfere with the validator if the text or graphics are scanned.

Reducing the beam width and focusing it to specific areas also reduces light reflection interference to the validator from the media, ribbon, tear bar, or other shiny surfaces.

You can set the Beam Width parameter to a value of 250 to 3100. The default is 1800, 2550, or 3100 (4, 6, or 8 inch printers).
The higher the value, the wider the beam width.

NOTE: The Beam Width menu item will change the width of the scanning beam but it is assumed that users will use the Beam Shift menu item to move the beam to the correct horizontal focus point.

1. Press ⠶ to take the printer offline and place the printer in Menu mode.

2. If necessary, press ↓ and ↵ at the same time to unlock the ↵ key.

3. Press ⠶ until VALIDATOR displays.

4. Press ↑ until Beam Width displays.

5. Press **+** or **–** to scroll through the values: 250 to 3100.
   The default is 1800, 2550, or 3100 (4, 6, or 8 inch printer).

6. Press ↵ to accept the desired value.

7. Save this configuration and set it as the Power-Up configuration in the CONFIG CTRL menu.

8. Cycle power for the new setting to take effect.

9. The beam may need to be moved horizontally. See "Beam Shift" on page 70.

Beam Shift

This option enables you to shift the scanning beam horizontally to the left or right. The left edge of the beam should be approximately 0.25 inches (6.35 mm) from 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 is 0. Lower values will move the beam to the left.

1. Press ⬚ to take the printer offline and place the printer in Menu mode.

2. If necessary, press ↓ and ↵ at the same time to unlock the ↵ key.

3. Press ⬚ until VALIDATOR displays.

4. Press ↑ until Beam Shift displays.

5. Press **+** or **–** to scroll through the values: –99 to 99. The default is 0. Lower values will move the beam to the left. Press ↵ to accept the shift value.

6. Keep selecting the new value until the beam width is at the desired position. The left edge of beam should be approximately 0.25 inches (6.35 mm) from the left edge of the tear bar.

7. Save the configuration for future use. (Refer to Saving A Configuration in the *Administrator's Manual*.)

Comm Error

This menu allows the 'Validator not communicating' error to be clearable by the user or not clearable by the user. If 'clearable' is selected then the user will be able to clear the fault and print jobs. <u>Barcodes in these jobs will not be validated</u>. If 'not clearable' is selected then the user must resolve the error and recycle the printer power in order to print.

General Process for Barcode Analysis

The following flow chart is an overview of how the validator performs the barcode analysis.

Edge Determination

Reflectance Minimum <= Threshold percentage of Reflectance Maximum

Min. Edge Contrast (worst pair) >= Min. Edge Contrast Threshold

Symbol contrast >= Symbol contrast Threshold

Grading Scale:
A: >= 70%
B: >= 55%
C: >= 40%
D: >= 20%
F: < 20%

Modulation >= Modulation Threshold

Grading Scale:
A: >= 70%
B: >= 60%
C: >= 50%
D: >= 40%
F: < 40%

Defects <= Defects Threshold

Grading Scale:
A: <= 15%
B: <= 20%
C: <= 25%
D: <= 30%
F: > 30%

Decodeability >= Decodeability Threshold

Grading Scale:
A: >= 62%
B: >= 50%
C: >= 37%
D: >= 25%
F: < 25%

Percent Decode >= Percent Decode Threshold

Overall Grade >= Overall Grade Threshold

Grading Scale:
A: 3.5 to 4.0
B: 2.5 to 3.4
C: 1.5 to 2.4
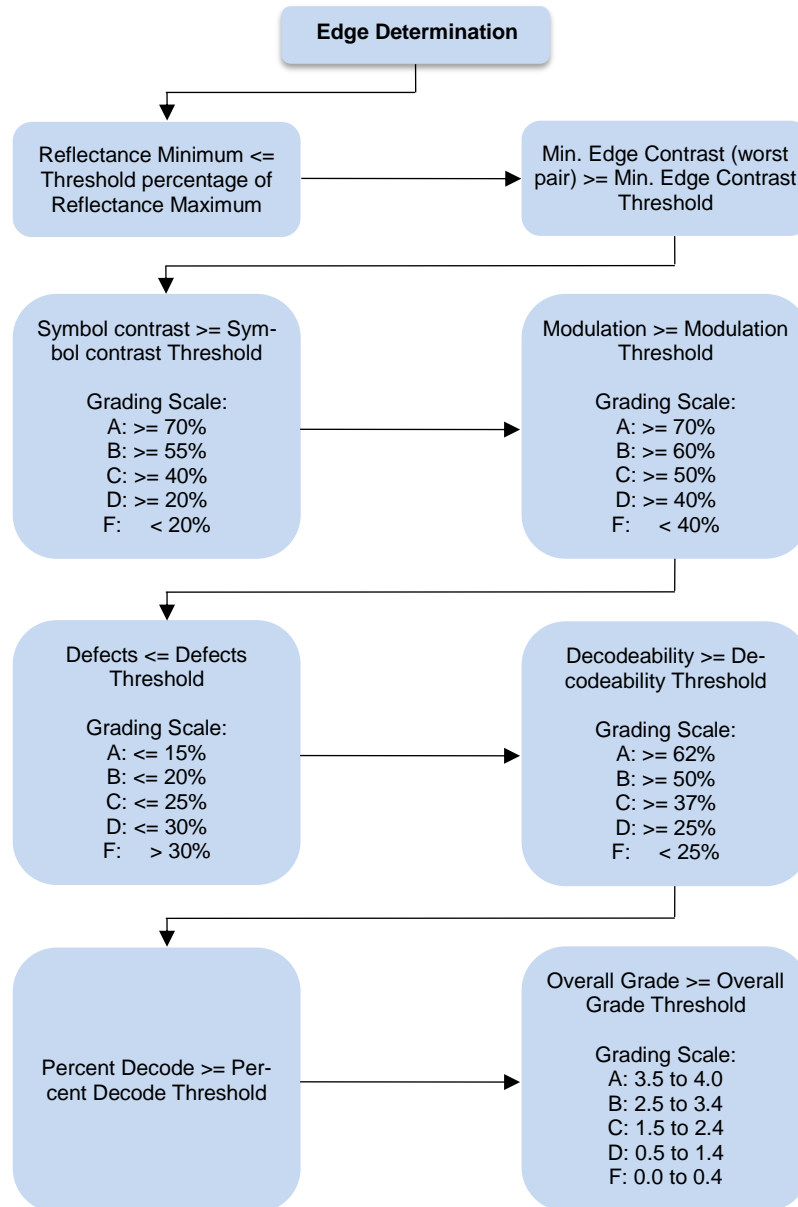D: 0.5 to 1.4
F: 0.0 to 0.4

Figure 26. Barcode Analysis Flowchart

Operation

There are a number of factors which contribute to successful bar code validation, including printer speed, on-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: minimum code height (bar code height) and minimum code gap. The printer automatically examines the Min. Code Height and Min. Code Gap values and sets the defined maximum slew (vertical paper movement) and print speeds to insure proper operation. If the current Print Speed and/or Slew Speed values in the MEDIA CONTROL menu are higher than the newly defined maximum, the values are changed to equal the maximum. If the current values are lower than the newly defined maximum, no change in speed occurs.

Min. Code Height (Bar 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 display. 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:

$$\frac{\text{Bar Code Height In Inches}}{0.030} = \text{Maximum Printer Speed In Inches Per Second}$$

NOTE: Set Min. Code Height to the height of the shortest bar code on the label.

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

To change the Min. Code Height:

1. Press ⠿ to take the printer offline and place the printer in Menu mode.

2. If necessary, press ↓ and ↵ at the same time to unlock the ↵ key.

3. Press ⠿ until VALIDATOR displays.

4. Press ↓ until Min. Code Height displays.

5. Press + or – to scroll through the choices: 0.13 to 1.00 inches in 0.01 inch increments. The default is 0.30 inches.

6. Press ↵ to select the desired value. The printing and slew speeds will be changed after ↵ is pressed.

7. Press ↓ and ↵ at the same time to lock the ↵ key, then press **PAUSE** to take the printer offline.

8. Press **PAUSE** again to put the printer online.

To set the printer speed manually:

1. Press ⠿ to take the printer offline and place the printer in Menu mode.

2. If necessary, press ↓ and ↵ at the same time to unlock the ↵ key.

3. Press ⠿ until MEDIA CONTROL displays.

4. Press ↓ until Print Speed displays.

5. Press **+** or – to scroll through the choices.

6. Press ↵ to select the desired value.

7. Press ↓ and ↵ at the same time to lock the ↵ key, then press **PAUSE** to take the printer offline.

8. Press **PAUSE** again to put the printer online.

Min. Code Gap

Min. Code Gap
Distance from the bottom of a bar code to the top of the next bar code

Bar code
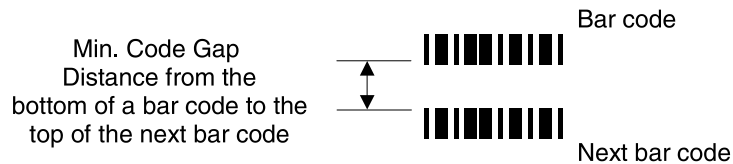
Next bar code

Minimum Code Gap represents the distance between the closest bar codes within a print job. The distance is measured from the bottom of one bar code to the top of the next bar code. The closest bar codes can be located on two separate labels or on the same label.

This distance is important because it affects how fast the Print Speed can be set. If the bottom-most bar code on one label is very close to the top-most bar code on the next label, the printer could have trouble distinguishing which bar code correlates with which label. To avoid the risk of miscorrelation, the printer automatically set its Print Speed.

The default is 0.30 inches. The range is 0.15 to 1.00 inches in 0.01 inch increments.

Use this formula to determine printer speed in relation to minimum code gap:

$$\frac{\text{Min. Code Gap In Inches}}{0.050} = \text{Maximum Printer Speed In Inches Per Second}$$

To change the Min. Code Gap:

1. Press ⠿ to take the printer offline and place the printer in Menu mode.

2. If necessary, press ↓ and ↵ at the same time to unlock the ↵ key.

3. Press ⋮≡ until VALIDATOR displays.

4. Press ↓ until Min. Code Gap displays.

5. Press **+** or – to scroll through the choices: 0.15 to 1.00 inches in 0.01 inch increments. The default is 0.30 inches.

6. Press ↵ to select the desired value.

7. Press ↓ and ↵ at the same time to lock the ↵ key, then press **PAUSE** to take the printer offline.

8. Press **PAUSE** again to put the printer online.

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

On-Demand Printing

In order for each bar code to be successfully validated, the entire bar code must pass completely under the scanning beam, even when the printer is set up for on-demand printing. In cases where the bar code is close to the bottom of a label and the printer is in an on-demand printing mode, the printer automatically pushes the label past the scanning beam. 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 on-demand printing modes, the extra movements slow the printing process. You can avoid this by adjusting the form so that the bar code appears early enough on the form so that it will pass completely under the scanning beam during normal printing. This may involve rotating the form or moving the bar code to a different position on the form.

Bar Code Failures

The validator tells the printer to announce a fault condition in two situations:

- if the validator detects a bad bar code
- if the validator detects no bar code where it expects to find one.

How the printer reacts to these faults is determined by the printer's configuration settings, as described below.

Bad Bar Code Error Detection

The validator examines every bar code that passes under the scanning beam and sends an analysis report to the printer. If a bar code is reported to have failed to meet any of the acceptance criteria, an error condition is reported. How the printer then reacts is described in "Validator Action (Error Action)" on page 75.

Missing Bar Code Error Detection

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 scanning 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 the printer then reacts is described in "Validator Action (Error Action)" on page 75.

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®, IGP®/PGL®, 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 52.

Validator Action (Error Action)

The printer response is the same whether the error stems from a bad or missing bar code. It is determined by the Validator Action setting in the VALIDATOR menu:

1. Press ⸬☰ to take the printer offline and place the printer in Menu mode.

2. If necessary, press ↓ and ↵ at the same time to unlock the ↵ key.

3. Press ⸬☰ until VALIDATOR displays.

4. Press ↓ until Validator Action displays.

5. Press **+** or **–** to scroll through the choices:

    - **Retry Form** (default)

    - **Stop & Retry**

    - **Grade&Report**

    - **Rescan Form**

    - **Rescan&Retry**

    - **Rescan&Stop**

    - **Stop**

    - **Overstrike**

    These options are described in detail below.

6. Press ↵ to select the desired value.

7. Press ↓ and ↵ at the same time to lock the ↵ key, then press **PAUSE** to take the printer offline.

8. Press **PAUSE** again to put the printer online.

Forms Printed After an Error Detection

Because of physical differences between the location of the printhead and the scanning beam, one or more forms may print after a bad form (a form with a bar code error that the validator detected).

The number of forms printed after a bad form depends on the Label Length, Print Speed, and Slew Speed settings in the MEDIA CONTROL menu. Shorter forms and faster speeds tend to increase the number of forms printed before the validator has a chance to detect an error. Also, the validator may not detect an error on forms that have bar codes near the bottom of the form until the next form has already started printing.

Forms that print after a bad form are treated differently, depending upon the error action mode selected (see Table 5). Modes that require a reprint operation may need to reprint more than just the bad form.

Table 5. Actions Done to Forms That Print After A Bad Form

Error Action Mode	Action
Stop	Tagged as failed, even though it was never scanned.
Overstrike	Overstruck.
Retry Form	Overstruck and reprinted (default).
Stop & Retry	Reprinted.
Grade&Report	Not applicable (all forms are scanned once).
Rescan Form	Scanned. If error persists, it will be rescanned and overstruck.
Rescan&Retry	Scanned. If error persists, it will be overstruck and reprinted.
Rescan&Stop	Scanned. If error persists, it will be tagged as failed, even though it was never scanned.

Stop

If the validator detects a bar code failure, the print job stops, the printer status indicator lamp flashes, the alarm sounds, and the appropriate error message displays.

The printer remains in a fault condition until you press the PAUSE key. This clears the error message and takes the printer offline. You must correct any condition that may have caused the fault. When ready, the printer can be put back online and it will resume printing with the form immediately following the bad form and any other forms printed prior to the physical stop (see "Forms Printed After an Error Detection" on page 75).

Overstrike

Use Overstrike mode when you want bad labels to be marked, but not reprinted (i.e., when using pre-numbered labels).

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

Without pausing, the printer then automatically reverses to the top of the bad form. It then prints an obliterating pattern over the bad form and any other forms printed prior to the physical stop (see "Forms Printed After an Error Detection" on page 75). By default, the obliterating pattern is a grid of fine lines which clearly marks the label as bad but allows you to read what was originally printed.

In the VALIDATOR menu, the Overstrike Style options are: Grid, Grey, Checkerboard, or Error Type Msg.

IMPORTANT **If you are using an RFID encoder, set the validator Overstrike Style different than the RFID Overstrike Style (in the RFID CONTROL menu). This will help you differentiate between a validator error and an RFID error.**

After the overstrike printing, the printer clears the error message and stops the alarm, then resumes normal printing at the point the job was stopped.

If more than one form is overstruck, only the first overstruck form is lost (the one with the missing or bad bar code), and a separate print command is required to resend it from the host, if needed. The rest of the overstruck forms are automatically resent.

Retry Form

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.

NOTE: The number of times the printer will attempt to reprint the bad form is determined by the Num Retry setting. See "Num Retry" on page 55.

The printer will stop, indicate an error, and overstrike as described on page 76. Then it will skip a number of blank labels, depending on the setting for Skip Labels (see "Setting for Skip Labels" on page 53). It will then slew to the next top of a blank form and reprint the bad form and any other overstruck forms (see "Forms Printed After an Error Detection" on page 75).

Once the Num Retry counter has been exhausted, the print job stops completely. After you clear the error message, the printer will print the same label or the next label, depending on the setting for Max Retry Action (see "Max Retry Action" on page 55).

Stop & Retry

This mode is similar to the Stop mode: the printer will stop printing and display the error message. After you clear the error message, it will then skip a number of blank labels, depending on the setting for Skip Labels (see "Setting for Skip Labels" on page 53). Then it will slew to the next top of a blank form and reprint the bad form and any other forms printed prior to the physical stop (see "Forms Printed After an Error Detection" on page 75).

NOTE: The number of times the printer will attempt to reprint the bad form is determined by the Num Retry setting. See "Num Retry" on page 55.

The printer will stop after the specified Num Retry attempts. After you clear the error message, the printer will print the same label or the next label, depending on the setting for Max Retry Action (see "Max Retry Action" on page 55).

Grade&Report

In this mode, the entire print job will print uninterrupted. If one or more errors is detected, the printer status indicator lamp flashes, the alarm sounds, and the error message "Bar code fails / Job has errors" displays.

IMPORTANT **The error message lets you know that at least one bad form printed. To determine which form(s) are bad, you must manually scan all of them.**

The printer remains in a fault condition until you press the PAUSE key. This clears the error message and takes the printer offline. Correct any condition that may have caused the fault, then press PAUSE to place the printer back online.

Rescan Form

This mode is similar to the Retry Form mode, however, instead of backing up and overstriking the form, the printer will back up and rescan the bad form and any other forms that have already printed (see "Forms Printed After an Error Detection" on page 75).

NOTE: The number of times the printer will attempt to rescan the form and following forms is determined by the Num Rescan setting. See "Num Rescan" on page 55.

If the printer scans these forms correctly on any of the rescans, it will continue printing with the next form.

If the printer fails to scan these forms correctly on all of the rescans, it will overstrike the forms, stop, and indicate an error similar to Stop mode. After you clear the error message, the printer will skip a number of blank labels, depending on the setting for Skip Labels (see "Setting for Skip Labels" on page 53).

It will then slew to the next top of a blank form and reprint the same form or go the next form, depending on the setting for Max Retry Action (see "Max Retry Action" on page 55).

NOTE: The only difference between Rescan Form and Rescan&Stop is that when a form still fails after all the rescans, Rescan Form will overstrike the bad form, whereas Rescan&Stop will not.

Rescan&Retry

This mode is similar to Rescan Form with one exception: after the printer has rescanned the form and overstruck it if there was still a fault, it will reprint and rescan the same form again.

NOTE: The number of times the printer will attempt to *rescan* the form is determined by the Num Rescan setting. See "Num Rescan" on page 55.

The number of times the printer will attempt to *reprint* the bad form is determined by the Num Retry setting. See "Num Retry" on page 55.

If the printer scans these forms correctly on any of the rescans or reprints, it will continue printing with the next form.

If the printer fails to scan these forms correctly on all of the rescans and reprints, it will overstrike the forms, stop, and indicate an error similar to Stop mode. After you clear the error message, the printer will skip a number of blank labels, depending on the setting for Skip Labels (see "Setting for Skip Labels" on page 53).

It will then slew to the next top of a blank form and reprint the same form or go the next form, depending on the setting for Max Retry Action (see "Max Retry Action" on page 55).

Rescan&Stop

This mode is similar to the Retry Form mode, however, instead of backing up and overstriking the form, the printer will back up and rescan the bad form and any other forms that have already printed (see "Forms Printed After an Error Detection" on page 75).

NOTE: The number of times the printer will attempt to rescan the form and following forms is determined by the Num Rescan setting. See "Num Rescan" on page 55.

If the printer scans these forms correctly on any of the rescans, it will continue printing with the next form.

If the printer fails to scan these forms correctly on all of the rescans, it will stop and indicate an error similar to Stop mode. After you clear the error message, the printer will skip a number of blank labels, depending on the setting for Skip Labels (see "Setting for Skip Labels" on page 53).

It will then slew to the next top of a blank form and reprint the same form or go to the next form, depending on the setting for Max Retry Action (see "Max Retry Action" on page 55).

NOTE: The only difference between Rescan Form and Rescan&Stop is that when a form still fails after all the rescans, Rescan Form will overstrike the bad form, whereas Rescan&Stop will not.

Error Messages

The validator can detect a number of errors. When one of these errors occurs, the validator alerts the printer to perform the currently selected error action (see "Validator Action (Error Action)" on page 75) and show the appropriate error message on the printer display. Validator error messages are explained in Table 6.

Table 6. Message List

Message	Explanation	Solution
Bar code fails Job has errors	This message appears when at least one label in a batch of labels has a data validation error. **NOTE:** This message appears only when Validator Action is set to Grade&Report.	1. Press **PAUSE** to clear the message. 2. Manually scan all the bar codes in the label batch, then reprint the bad labels.
Bar Code Improper Data Format	Data validation error: the bar code is not properly encoded. For example, a check sum is incorrect, a required number of characters is not met, or the required terminator characters are not included. This problem is almost always caused by incorrect form or host application design.	Fix the application so it sends data in the correct bar code format.

Table 6. Message List

Message	Explanation	Solution
Bar code quiet zone too small	Data validation error: the blank zone(s) left or right of the bar code is not big enough to meet the minimum requirement. Typically, this occurs in forms where bar codes are placed too close to other elements, 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 bar code should be ten times the minimum element width or 1/4 inch, whichever is greater. In addition, between bar codes, the validator requires a minimum distance of 20 times the minimum element width or 1/2 inch, whichever is greater.	1. Fix the application. 2. Disable Quiet Zone in the VALIDATOR menu.
Calibration warning	The validator has detected that it needs calibration. This message is a reminder and does not halt printing.	Press **PAUSE** to clear the message. Calibrate the validator. See "Calibration" on page 40.
Checksum Failure	The bar code data fails the checksum check or is missing the checksum digit.	Verify that the checksum digit exists in the bar code and that it is the correct value.
Contrast too low Check media	Data validation error: 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.	Increase Print Intensity or reduce Print Speed in the QUICK SETUP menu or via host software, change media, or set Symbol Contrast = 0% (to disable it) in the VALIDATOR menu.
ODV COMM ERR See Manual	Communication error between printer and online data validator (ODV).	Cycle power. If the problem persists, contact your authorized customer service representative.

Table 6. Message List

Message	Explanation	Solution
Overall Grade Fail	Overall data validation failure: decodeability, percent decode, defects, modulation, EC Min, Rmin, and/or Symbol Contrast.	1. Press **PAUSE** to clear the message. 2. Adjust the parameter that is causing the failure. To see which parameter is failing, run a Scan Report (62). 3. Lower the Overall Grade to a point where the worst parameter grade will be above the Overall Grade threshold.
Poor scanning Check heat&head	Data validation failure: decodeability. The difference between wide and narrow elements is too close for the validator to reliably discern. This usually indicates an improperly set heat/speed/pressure combination or the loss of a printhead element.	1. Adjust Print Intensity and Print Speed in the QUICK SETUP menu or via host software. 2. Adjust the printhead pressure. (Refer to the *Administrator's Manual*.)
Poor scanning Check media	Data validation failure: percent decode. 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, caused by ribbon wrinkle or debris on media.	1. Check for a wrinkled ribbon or debris on media. Roll wrinkled area onto take-up spindle. 2. Adjust the printhead pressure blocks. (Refer to the *Administrator's Manual.*)
Poor scanning Inspect head	Data validation failure: hardware defect. The validator detected unexpected dark spots in spaces or light spots in bars. This usually indicates a poor ribbon/media combination, a dirty printhead, or a burned pixel.	1. Check that paper and ribbon are clean, unwrinkled, and installed correctly. 2. Clean the printhead. 3. If message reappears, replace the printhead.

Table 6. Message List

Message	Explanation	Solution
Speed Exceeds Validator Limit	Print Speed is set above the maximum allowed for bar code printing by the validator as the Power-Up configuration with the validator option installed. An attempt was made to set Print Speed above the maximum allowed in the QUICK SETUP menu or via host software. Maximum speed depends on Min. Code Height and Min. Code Gap.	This message only appears briefly, and the speed is automatically reduced. Make sure Min. Code Height (page 72) and Min. Code Gap (page 73) are set correctly.

Table 6. Message List

Message	Explanation	Solution
Unscannable: xx Missing Codes	Data validation error: missing bar code. An expected bar code is missing or was printed so poorly that the validator cannot detect it. xx = number of bar codes missing on the form that caused the error.	1. Check that paper and ribbon are clean, unwrinkled, and installed correctly. 2. Run a print job and check that the validator beam is not obstructed; remove obstructions as necessary. 3. Run a print job and check that the READ LED flashes as bar codes exit the printer. If the READ LED does not flash, cycle power and run the job again. If the READ LED does not flash, inspect the cables and the cable connections. If the cables are undamaged and the connections are good, replace the validator. 4. If using bitmapped bar codes, set Number of Codes (page 52) to the number of codes per form (not Auto). 5. Adjust Print Intensity and Print Speed in the QUICK SETUP menu or via host software.

Table 6. Message List

Message	Explanation	Solution
Unscannable: xx Missing Codes (continued)		6. Make sure that Min. Read Scans (page 61) and Min. Code Height (page 72) are set correctly. 7. Make sure that all expected bar codes are printing. If the physical label is too small, the image may be clipped. 8. Press **PAUSE** to clear the message. 9. In the VALIDATOR menu, press ↓ until Clear Data displays, then press ↵.
Validator not communicating	1. The Validator Funct. = Enable in the VALIDATOR menu, but when the printer was first powered up it could not communicate with it. 2. The validator was connected to the printer and then later removed.	1. Check that the validator signal cable is securely connected to the validator unit. 2. Select Validator Funct. = Disable in the VALIDATOR menu. Save this setting in the Power-Up configuration in the CONFIG CTRL menu and reboot the printer.

Troubleshooting

If you are having problems with the validator, consult Table 7 for a list of symptoms and possible solutions.

Table 7. Troubleshooting the Validator

Symptom	Solution
The scanning beam does not come on.	1. Make sure the power/data cable is plugged into the validator and the controller board on the printer. See "Installation and Removal" on page 16. 2. Make sure the validator has not been disabled in the VALIDATOR menu. See "Enabling and Disabling the Validator" on page 48. 3. Print a bar code validation demo page (page 41). 4. Press the RESET button to turn the scanning beam on (page 43). 5. Call your service representative if the problem persists.
The scanning beam does not cover the entire width of the labels being printed.	1. Use Beam Shift to move the beam horizontally to cover the entire width of the labels. See "Shifting the Scanning Beam" on page 39. 2. Use Beam Width to adjust the width of the scanning beam. See "Beam Width" on page 69.
The printer pauses after scanning each label.	If you have an RFID encoder but are not encoding RFID tags, make sure RFID Reader is set to Disable (in the RFID CONTROL menu).
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 48.
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 clean the glass using a household glass cleaner and a dry, lint-free cloth.

Table 7. Troubleshooting the Validator

Symptom	Solution
The printed bar codes are causing error conditions.	There are a number of factors which could be causing validation errors: • The scanning beam is not properly aligned with the two notches on the tear bar of the printer. See "Adjust the Scanning Beam" on page 33. • Make sure the entire bar code passes completely under the scanning beam. • The validator and printer are not properly communicating. Test the validator operation without using a host. See "Bar Code Validation Demo Page" on page 41. • Bar code width. The validator can recognize x-dimensions as narrow as 6.6 mil for 300 dpi printers, and 10 mil for 203 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 inch is required for validation. If problems persist, increase the bar code height.

Table 7. Troubleshooting the Validator

Symptom	Solution
The printed bar codes are causing error conditions. (continued)	• Bar code type. 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. Stacked, 2D, and vertical (ladder) bar codes are not supported. • Bar code spacing.The validator requires a minimum distance of 1/2 inch or 20 times the minimum element width, whichever is greater, between bar codes. • Printer speed. See "Print Speed Limits" on page 72. If problems persist, decrease the Print Speed in the MEDIA CONTROL menu. • Be sure the bar code is not printing on the extreme edges of the label. • Clean the printhead. See "Cleaning" in the *Administrator's Manual*. • Check that paper and ribbon are clean, unwrinkled, and installed correctly. • Check the number of bar codes being validated concurrently. The validator can track the performance of up to four bar codes at one time.

Maintenance

WARNING	**Class 2 laser light. Do not stare into the laser beam or a reflected image of the laser beam.**
WARNING	**Using controls, making adjustments, or performing procedures other than those specified herein may result in hazardous radiation exposure.**

The validator is a self-contained unit that requires only periodic cleaning. Every so often, power down the printer and 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 the Printronix Customer Support Center. See "Contact Information" on page 89.

A   *Contact Information*

Printronix Customer Support Center

IMPORTANT   **Please have the following information available prior to calling the Printronix Customer Support Center:**

- Model number
- Serial number (located on the back of the printer)
- Installed options (i.e., interface and host type if applicable to the problem)
- Configuration printout (see "Printing A Configuration" in the *Administrator's Manual*)
- Is the problem with a new install or an existing printer?
- Description of the problem (be specific)
- Good and bad samples that clearly show the problem (faxing or emailing of these samples may be required)

Americas   (714) 368-2686

Europe, Middle East, and Africa (31) 24 6489 410

Asia Pacific   (65) 6548 4114

China   (86) 800-999-6836

http://www.printronix.com/support.aspx

Printronix Supplies Department

Contact the Printronix Supplies Department for genuine Printronix supplies.

Americas	(800) 733-1900
Europe, Middle East, and Africa	33 (0) 1 46 25 19 07
Asia Pacific	(65) 6548 4116 or (65) 6548 4182
China	(86) 400-886-5598
India	(800) 102-7869

http://www.printronix.com/supplies-parts.aspx

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