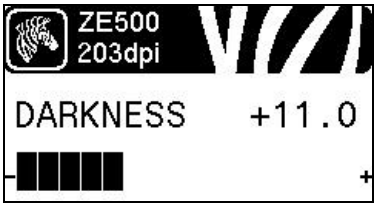
Operating Parameters on the Control Panel

Items in this menu are shown in the order in which they appear when you press the **RIGHT ARROW**. For more information about these settings, see *Print Settings* on page 71.

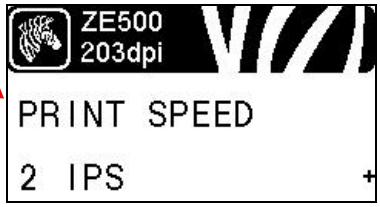
For information about RFID parameters, refer to *RFID Programming Guide 2*. You can download the latest copy from http://www.zebra.com/manuals.



Adjust the Print Darkness

Set the darkness to the lowest setting that provides good print quality. If you set the darkness too high, the label image may print unclearly, bar codes may not scan correctly, the ribbon may burn through, or the printhead may wear prematurely.

See *Print Darkness* on page 71 for more information.



Select the Print Speed

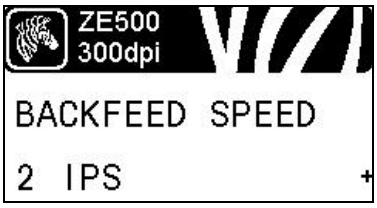
Select the speed for printing a label (given in inches per second). Slower print speeds typically yield better print quality.

See *Print Speed* on page 71 for more information.

Set the Slew Speed

The slew speed is the speed at which the printer skips over the areas in a label format that are blank across the full width of the image. A faster slew speed may reduce printing time. The print engine automatically senses when to apply this higher speed.

See *Slew Speed* on page 71 for more information.



Set the Backfeed Speed

Backfeed refers to the backward motion of the media from the tear-off or peel-off position to the print position. This motion occurs so that more of the lead edge of each label can be used for printing. Reducing backfeed speed can mitigate some issues. In general, reducing the backfeed speed may improve print quality at the start of the label. This speed defaults to 2 ips.

See *Backfeed Speed* on page 72 for more information.

Print Settings

Table 4 • Print Settings

Print Darkness	Set the darkness to the lowest setting that provides good print quality. If you set the darkness too high, the label image may print unclearly, bar codes may not scan correctly, the ribbon may burn through, or the printhead may wear prematurely. If desired, use the *FEED Self Test* on page 134 to determine the best darkness setting.
	Accepted values: 0.0 – 30.0
	Related ZPL command(s): ^MD, ~SD
	SGD command used: print.tone
	Control panel menu item: DARKNESS on page 19
	Printer web page: View and Modify Printer Settings > General Setup > Darkness
Print Speed	Select the speed for printing a label (given in inches per second). Slower print speeds typically yield better print quality.
	Accepted values: • ZE500-4 203 dpi: 2–12 ips • ZE500-4 300 dpi: 2–12 ips • ZE500-6 203 dpi: 2–12 ips • ZE500-6 300 dpi: 2–10 ips
	Related ZPL command(s): ^PR
	SGD command used: media.speed
	Control panel menu item: PRINT SPEED on page 19
	Printer web page: View and Modify Printer Settings > General Setup > Print Speed
Slew Speed	The slew speed is the speed at which the printer skips over the areas in a label format that are blank across the full width of the image. A faster slew speed may reduce printing time. The print engine automatically senses when to apply this higher speed.
	Accepted values: • ZE500-4 203 dpi: 2–12 ips • ZE500-4 300 dpi: 2–12 ips • ZE500-6 203 dpi: 2–12 ips • ZE500-6 300 dpi: 2–10 ips
	Related ZPL command(s): ^PR
	SGD command used: none
	Control panel menu item: SLEW SPEED on page 19
	Printer web page: none

Printing Issues

Table 12 identifies possible issues with printing or print quality, the possible causes, and the recommended solutions.

Table 12 • Printing Issues

Issue	Possible Cause	Recommended Solution
General print quality issues	The print engine is set at an incorrect print speed.	For optimal print quality, set the print speed to the lowest possible setting for your application via control panel, the driver, or the software. You may want to perform the *FEED Self Test* on page 134 to determine the optimal settings for your print engine. See *Print Speed* on page 71 for how to change the print speed.
	You are using an incorrect combination of labels and ribbon for your application.	1. Switch to a different type of media or ribbon to try to find a compatible combination. 2. If necessary, consult your authorized Zebra reseller or distributor for information and advice.
	The print engine is set at an incorrect darkness level.	For optimal print quality, set the darkness to the lowest possible setting for your application. You may want to perform the *FEED Self Test* on page 134 to determine the ideal darkness setting. See *Print Darkness* on page 71 for how to change the darkness setting.
	The printhead is dirty.	Clean the printhead. See *Clean the Printhead and Rollers* on page 111.
	Incorrect or uneven printhead pressure.	1. Position the printhead toggles correctly. See *Toggle Positioning* on page 104. 2. Set the printhead pressure to the minimum needed for good print quality. See *Printhead Pressure Adjustment* on page 106.
Loss of printing registration on labels. Excessive vertical drift in top-of-form registration.	The platen roller, pinch roller, or peel roller is dirty.	Clean the printhead and rollers. See *Clean the Printhead and Rollers* on page 111.
	Media guides are positioned improperly.	Ensure that the media guides are properly positioned. See *Load Ribbon and Media* on page 60.
	The media type is set incorrectly.	Set the print engine for the correct media type (gap/notch, continuous, or mark). See *Media Type* on page 74.
	The media is loaded incorrectly.	Load media correctly. See *Load Ribbon and Media* on page 60.

FEED Self Test

Different types of media may require different darkness settings. This section contains a simple but effective method for determining the ideal darkness for printing bar codes that are within specifications.

During the FEED self test, labels are printed at different darkness settings at two different print speeds. The relative darkness and the print speed are printed on each label. The bar codes on these labels may be ANSI-graded to check print quality.

During this test, one set of labels is printed at 2 ips, and another set is printed at 6 ips. The darkness value starts at three settings lower than the print engine's current darkness value (relative darkness of –3) and increase until the darkness is three settings higher than the current darkness value (relative darkness of +3).

To perform a FEED self test, complete these steps:

1. Print a configuration label to show the print engine's current settings.
2. Turn off (**O**) the print engine.
3. Press and hold **FEED** while turning on (**I**) the print engine. Hold **FEED** until the first control panel light turns off.

   The print engine prints a series of labels (Figure 15) at various speeds and at darkness settings higher and lower than the darkness value shown on the configuration label.

Figure 15 • FEED Test Label

4. See Figure 16 and Table 18. Inspect the test labels and determine which one has the best print quality for your application. If you have a bar code verifier, use it to measure bars/spaces and calculate the print contrast. If you do not have a bar code verifier, use your eyes or the system scanner to choose the optimal darkness setting based on the labels printed in this self test.

Figure 16 • Bar Code Darkness Comparison

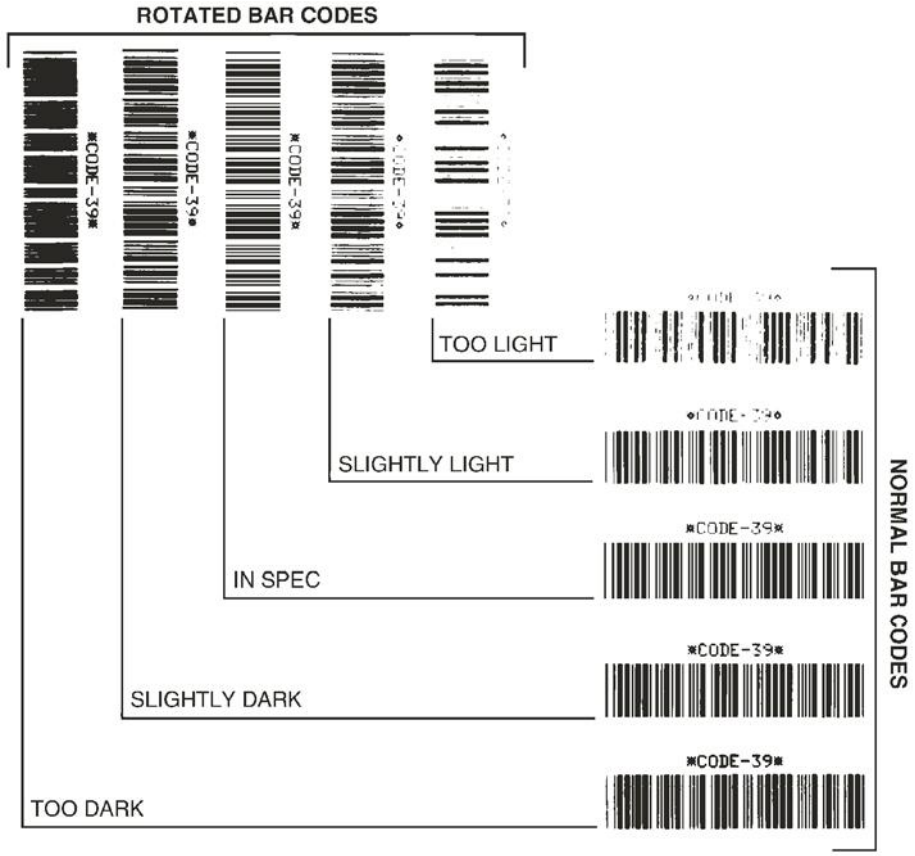


Table 18 • Judging Bar Code Quality

Print Quality	Description
Too dark	Labels that are too dark are fairly obvious. They may be readable but not “in-spec.” • The normal bar code bars increase in size. • The openings in small alphanumeric characters may fill in with ink. • Rotated bar code bars and spaces run together.
Slightly dark	Slightly dark labels are not as obvious. • The normal bar code will be “in-spec.” • Small character alpha numerics will be bold and could be slightly filled in. • The rotated bar code spaces are small when compared to the “in-spec” code, possibly making the code unreadable.

Table 18 • Judging Bar Code Quality (Continued)

Print Quality	Description
"In-spec"	The "in-spec" bar code can only be confirmed by a verifier, but it should exhibit some visible characteristics. • The normal bar code will have complete, even bars and clear, distinct spaces. • The rotated bar code will have complete, even bars and clear, distinct spaces. Although it may not look as good as a slightly dark bar code, the bar code will be "in-spec." • In both normal and rotated styles, small alphanumeric characters look complete.
Slightly light	Slightly light labels are, in some cases, preferred to slightly dark ones for "in-spec" bar codes. • Both normal and rotated bar codes will be in spec, but small alphanumeric characters may not be complete.
Too light	Labels that are too light are obvious. • Both normal and rotated bar codes have incomplete bars and spaces. • Small alphanumeric characters are unreadable.

5. Note the relative darkness value and the print speed printed on the best test label.
6. Add or subtract the relative darkness value from the darkness value specified on the configuration label. The resulting numeric value is the best darkness value for that specific label/ribbon combination and print speed.
7. If necessary, change the darkness value to the darkness value on the best test label.
8. If necessary, change the print speed to the same speed as on the best test label.