ZebraNet®

Wireless User Guide

for the Wireless Print Server, Wireless Plus Print Server, and Internal Wireless Plus Print Server

with printer firmware versions X.15.x and later,
or with some ZSPx firmware versions

14143L-007

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About This Document

This section provides you with contact information, document structure and organization, and additional reference documents.

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Who Should Use This Document

This User Guide is intended for use by someone who needs to configure and use a wireless print server for use with a supported printer.

This version of the User Guide supports the ZebraNet Wireless Print Server, the ZebraNet Wireless Plus Print Server, and the ZebraNet Internal Wireless Plus Print Server with printer firmware versions X.15.x or later. Some features or printers require X.16.x, X.17.x, or later.

The following special versions of firmware or later also are supported. They are referred to in this User Guide as ZSPx firmware.

- ZSP994P
- ZSP999F
- ZSP1027F
- ZSP1056E
- ZSP1082F

For older versions of firmware, refer to the *Wireless Print Server User Guide*, part number 13422L-XXX.

How This Document Is Organized

The User Guide is set up as follows:

Section	Description
Introduction *on page 11*	This section provides an overview of the ZebraNet wireless print servers, including the Wireless Print Server, Wireless Plus Print Server, and Internal Wireless Plus Print Server.
Wireless Status and Settings *on page 25*	This section presents several options for viewing or modifying the wireless status and settings.
Troubleshooting *on page 41*	This section provides solutions to problems related specifically to the wireless print servers.
WebView Web Pages *on page 47*	This section provides you with instructions for viewing the current print server settings.

Contacts

Technical Support via the Internet is available 24 hours per day, 365 days per year.

Web Site: www.zebra.com
E-mail Back Technical Library:
E-mail address: emb@zebra.com
Subject line: Emaillist
Self Service Knowledge Base: www.zebra.com/knowledgebase
Online Case Registration: www.zebra.com/techrequest

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Technical Training Department For Zebra product training courses.	T: +1 847 793 6868 T: +1 847 793 6864 F: +1 847 913 2578 E: ttamerica@zebra.com	T: +44 (0) 1628 556000 F: +44 (0) 1628 556001 E: Eurtraining@zebra.com	T: + 65 6858 0722 F: +65 6885 0838 E: *China:* tschina@zebra.com *All other areas:* tsasiapacific@zebra.com
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Customer Service Department (US) **Internal Sales Department (UK)** For printers, parts, media, and ribbon, please call your distributor or contact us.	T: +1 877 ASK ZEBRA (275 9327) E: clientcare@zebra.com	T: +44 (0) 1628 556032 F: +44 (0) 1628 556001 E: cseurope@zebra.com	T: +65 6858 0722 F: +65 6885 0836 E: *China*: order-csr@zebra.com *All other areas:* csasiapacific@zebra.com

Key: T: Telephone
F: Facsimile
E: E-mail

Document Conventions

The following conventions are used throughout this document to convey certain information.

Alternate Color (online only) Cross-references contain hot links to other sections in this guide. If you are viewing this guide online in .pdf format, you can click the cross-reference (blue text) to jump directly to its location.

LCD Display Examples Text from a printer's Liquid Crystal Display (LCD) appears in `Bubbledot ICG` font.

Command Line Examples Command line examples appear in `Courier New` font. For example, type `ZTools` to get to the Post-Install scripts in the `bin` directory.

Files and Directories File names and directories appear in `Courier New` font. For example, the `Zebra<version number>.tar` file and the `/root` directory.

Icons Used

Identifies features that are available in printers with firmware version X60.15.x, X50.15.x, or later.

Caution • Warns you of the potential for electrostatic discharge.

Caution • Warns you of a potential electric shock situation.

Caution • Warns you of a situation where excessive heat could cause a burn.

Caution • Advises you that failure to take or avoid a specific action could result in physical harm to you.

Caution • (No icon) Advises you that failure to take or avoid a specific action could result in physical harm to the hardware.

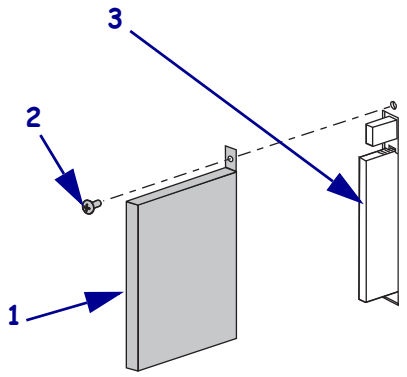
Important • Advises you of information that is essential to complete a task.

Note • Indicates neutral or positive information that emphasizes or supplements important points of the main text.

Example • Provides an example, often a scenario, to better clarify a section of text.

Illustration Callouts Callouts are used when an illustration contains information that needs to be labeled and described. A table that contains the labels and descriptions follows the graphic. Figure 1 provides an example.

Figure 1 • Sample Figure with Callouts



1	Clear plastic RF card cover (not used on all printers)
2	Screw
3	Wireless radio card

Notes • _____

_____

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_____

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1 Introduction

This section provides an overview of the ZebraNet wireless print servers, including the Wireless Print Server, Wireless Plus Print Server, and Internal Wireless Plus Print Server.

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Printer Requirements and Print Server Features

This section defines the requirements for using the different ZebraNet wireless print servers. It also defines features of and limitations to the wireless print servers on different printer models.

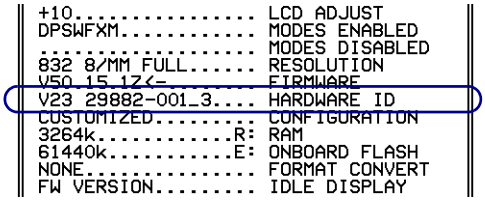
Hardware

PCMCIA and Compact Flash Memory Cards PCMCIA memory or Compact Flash memory cards will not work and are not supported on the Wireless Plus Print Server. The Internal Wireless Plus Print Server does not include a slot for these card types.

Wireless Card Socket Option The ZebraNet wireless print server options replace the Wireless Card Socket Option (WCSO) in 105*SL* printers with a serial number of 6400357 or greater. Do not install a wireless option board on a 105*SL* printer with a serial number that is less than 6400357.

Wireless Option Board A special wireless option board must be installed in your printer/print engine. To determine if you have a wireless option board installed, use a printer configuration label (refer to the instructions in the User Guide that came with your printer). To purchase a wireless option, contact your authorized Zebra reseller for more information.

The wireless option boards are identified by the HARDWARE ID line on the printer configuration label.



The part numbers shown on the HARDWARE ID line indicate the wireless print servers as shown in Table 1.

Table 1 • Zebra Part Numbers for Wireless Print Server Boards

Part Number	Corresponds to the Following
29651-0xx	Wireless Plus Print Server
29652-0xx	Internal Wireless Plus Print Server
29881-009*	Wireless Print Server
29882-001	Wireless Plus Print Server
29883-001	Internal Wireless Plus Print Server
79087	Wireless Print Server
79088	Wireless Print Server
79089	Wireless Print Server
79090	Wireless Print Server

* Not supported by this manual. Refer to the *Wireless Print Server User Guide*, part number 13422L-XXX.

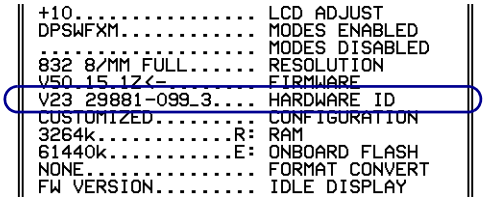
Firmware

After a wireless option board is installed, your printer must be running a supported firmware version (Table 2) to access the features in this manual. You may download the latest firmware appropriate for your printer to access the latest encryption features. Go to http://www.zebra.com/firmware for firmware download options. With the Wireless Print Server, not all features in this manual may be available to you.

Table 2 • Supported Firmware Versions

Printer	ZebraNet Wireless Print Server	ZebraNet Wireless Plus Print Server	ZebraNet Internal Wireless Plus Print Server
105SL	X60.15.X	X60.15.X	X60.16.X
HC100	N/A	N/A	V54.16.X
110PAX4, 170PAX4	X60.15.X	X60.15.X	X60.16.X
R110PAX4	R62.15.X R63.15.X	R62.15.X R63.15.X	R62.16.X R63.16.X
R110Xi, R170Xi	R60.15.X	R60.15.X	R60.16.X
R110Xi HF	R65.15.X	R65.15.X	R65.16.X
R110Xi4	N/A	V.53.17.7 or later	V.53.17.7 or later
R4Mplus	ZSP994P ZSP999F ZSP1027 ZSP1056E ZSP1082F	N/A	N/A
RZ400, RZ600	R53.16.X	R53.16.X	R53.16.X
S4M	V50.15.X X53.15.X	V50.15.X X53.15.X	X53.16.X
XiIIIPlus	X60.15.X	X60.15.X	X60.16.X
Xi4	N/A	X53.17.X	X53.17.X
Z4Mplus, Z6Mplus	X60.15.X	N/A	N/A
ZM400, ZM600	N/A	X53.15.X	X53.16.X

S4M Printers S4M printers with an older wireless option boards cannot use firmware versions V50.15.*X* or later. View the `HARDWARE ID` line on a printer configuration label. If the number `29881-099` appears, you must use firmware V50.13.x, and refer to the *Wireless Print Server User Guide* (part number 13422L-XXX) for your printer.

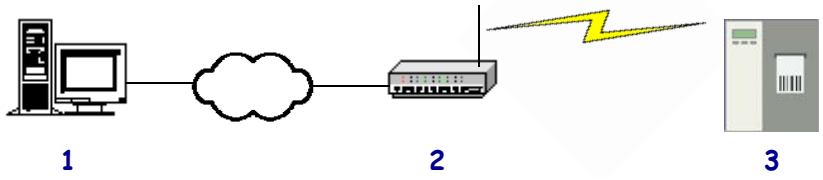


Connecting to a Wireless Network

The ZebraNet wireless print servers are Ethernet connectivity options for your printer. With one of these wireless print servers, the printer communicates with a wireless Local Area Network (WLAN) through a wireless radio card instead of being connected to a wired Local Area Network (LAN) with physical wires.

Figure 2 shows the network architecture of a typical WLAN setup. Two critical WLAN components for wireless operation are a wireless radio card and an access point. The ZebraNet Internal Wireless Plus Print Server has a built-in wireless radio card.

Figure 2 • WLAN Setup with the ZebraNet Wireless Print Server or Wireless Plus Print Server



1	Computer (stand-alone or laptop)
2	Access point
3	Printer configured with a ZebraNet wireless print server and equipped with a supported wireless radio card (if applicable)

Access Point

A third-party access point forms a bridge between the WLAN and wired LAN. Select an access point that is compatible with the supported wireless radio cards that you will use with your ZebraNet wireless print server. Some access points may not support all ZebraNet wireless print servers.

Multiple access points can be used to extend the coverage of the wireless LAN. The reassociation capabilities of the IEEE 802.11b/g standard enable clients to move throughout the WLAN area and roam between access points. Reassociation can occur as long as the ZebraNet wireless print server is on the same network configurations and ESSID (network name) as the access point to which it is trying to connect.

Supported Wireless Radio Cards

Note • The ZebraNet Internal Wireless Print Server has a built-in wireless radio card. This section applies only to the ZebraNet Wireless Print Server and the ZebraNet Wireless Plus Print Server.

A supported third-party PCMCIA, Compact Flash™, or CardBus wireless radio card is required for the printer to qualify with the WLAN. After the wireless option board is installed in the printer, the wireless radio card inserts into a slot on this board. A wireless radio card is NOT provided with the ZebraNet Wireless Print Server or the ZebraNet Wireless Plus Print Server.

Supported Wireless Cards Table 3 lists the wireless radio cards that are supported at the time of this release. Some wireless radio cards listed here may not support all ZebraNet wireless print server features. See Table 5 on page 16 or check with the card manufacturer to ensure that the card that you wish to use supports the wireless security type used on your WLAN. Check the operating conditions (such as temperature and humidity) for the wireless radio card that you choose. If the card has more restrictions than the printer, this may limit the conditions under which you can operate the printer with a wireless connection.

Table 3 • Supported Wireless Cards by Manufacturer

Manufacturer	Model	ZebraNet Wireless Print Server	ZebraNet Wireless Plus Print Server
Symbol® Technologies	LA-4137*	supported	supported
	LA-4121 Series	supported	supported
Cisco® Systems	CB21	not supported	supported
	340 Series	supported	supported
	350 Series	supported	supported

* This card requires an adapter.

Wireless Card Firmware Table 4 lists specific firmware versions required to support the features in this manual. You may be able to download new firmware to your wireless radio card. Check with the card manufacturer for more information.

Table 4 • Required Wireless Card Firmware

Manufacturer	Model	Required Wireless Card Firmware
Symbol Technologies	LA-4137	The card must have firmware version F3.91-69 or later.
	LA-4121 Series	The card must have firmware version V2.90-58 or later.
Cisco Systems	CB21	The card must have firmware version 5.60.21 or later.
	340 Series	
	350 Series	

Supported Security Types

Your WLAN can use any of a number of different types of security and encryption, or it can use none at all. This section shows which security types you can use with the different ZebraNet wireless print servers.

Note • Configuring a printer for WPA also allows the printer to be used in WPA2 environments.

ZebraNet Wireless Plus Print Server

Table 5 lists the security types that are supported by the Wireless Plus Print Server. Support varies by the card manufacturer and the card type. Select a wireless radio card that is supported by your wireless print server and that supports the security type being used on your WLAN.

Table 5 • Security Types Supported on the Wireless Plus Print Server

Security Type	Card Manufacturer			
	Cisco		Symbol	
	Cisco CB21	Cisco 350	LA-4121 (PCMCIA)	LA-4137 Compact Flash
Open	Yes	Yes	Yes	Yes
EAP-FAST	Yes	Not Supported	Yes	Yes
EAP-TLS	Yes	Not Supported	Yes	Yes
EAP-TTLS	Yes	Not Supported	Yes	Yes
Kerberos	Not Supported	Not Supported	Yes	Yes
LEAP	Yes	Yes	Yes	Yes
PEAP	Yes	Not Supported	Yes	Yes
WEP (40 bit and 128 bit)	Yes	Yes	Yes	Yes
WPA - LEAP	Yes	Yes	Yes	Yes
WPA - PSK	Yes	Yes	Yes	Yes
WPA- EAP-FAST	Yes	Yes	Yes	Yes
WPA- EAP-TLS	Yes	Yes	Not Supported	Yes
WPA- EAP-TTLS	Yes	Yes	Not Supported	Yes
WPA- PEAP	Yes	Yes	Yes	Yes
WPA2 - LEAP	Yes	Not Supported	Not Supported	Not Supported
WPA2 - PSK*	Yes*	Not Supported	Not Supported	Not Supported
WPA2- EAP-FAST	Yes	Not Supported	Not Supported	Not Supported
WPA2- EAP-TLS	Yes	Not Supported	Not Supported	Not Supported

* Key rotation for WPA2 PSK is supported in firmware version V60.15.8Z or later, V53.15.8Z or later., V54.16.x or later, and RX.15.8Z or later.

Table 5 • Security Types Supported on the Wireless Plus Print Server (Continued)

Security Type	Card Manufacturer			
	Cisco		Symbol	
	Cisco CB21	Cisco 350	LA-4121 (PCMCIA)	LA-4137 Compact Flash
WPA2- EAP-TTLS	Yes	Not Supported	Not Supported	Not Supported
WPA2- PEAP	Yes	Not Supported	Not Supported	Not Supported

* Key rotation for WPA2 PSK is supported in firmware version V60.15.8Z or later, V53.15.8Z or later., V54.16.x or later, and RX.15.8Z or later.

ZebraNet Internal Wireless Plus Print Server

Table 6 lists the security types that are supported by the Internal Wireless Plus Print Server.

Table 6 • Security Types Supported on the Internal Wireless Plus Print Server

Security Type	Supported?
Open	Yes
EAP-FAST	Yes
EAP-TLS	Yes
EAP-TTLS	Yes
Kerberos	Not Supported
LEAP	Yes
PEAP	Yes
WEP (40 bit and 128 bit)	Yes
WPA - LEAP	Yes
WPA - PSK	Yes
WPA- EAP-FAST	Yes
WPA- EAP-TLS	Yes
WPA- EAP-TTLS	Yes
WPA- PEAP	Yes
WPA2 - LEAP	Yes
WPA2 - PSK	Yes
WPA2- EAP-FAST	Yes
WPA2- EAP-TLS	Yes
WPA2- EAP-TTLS	Yes
WPA2- PEAP	Yes

ZebraNet Wireless Print Server

Table 7 lists the security types that are supported by the Wireless Print Server. Support varies by the card manufacturer and the card type. Select a wireless radio card that is supported by your wireless print server and that supports the security type being used on your WLAN. The Wireless Print Server does not support the Cisco CB21 radio card.

Table 7 • Security Types Supported on the Wireless Print Server

Security Type	Card Manufacturer		
	Cisco	Symbol	
	Cisco 350	LA-4121 (PCMCIA)	LA-4137 Compact Flash
Open	Yes	Yes	Yes
EAP-FAST	Not Supported	Yes	Yes
EAP-TLS	Not Supported	Yes	Yes
EAP-TTLS	Not Supported	Yes	Yes
Kerberos	Not Supported	Yes	Yes
LEAP	Yes	Yes	Yes
PEAP	Not Supported	Yes	Yes
WEP (40 bit and 128 bit)	Yes	Yes	Yes
WPA - LEAP	Yes	Yes	Yes
WPA - PSK	Yes	Yes	Yes
WPA- EAP-FAST	Yes	Yes	Yes
WPA- EAP-TLS	Yes	Not Supported	Yes
WPA- EAP-TTLS	Yes	Not Supported	Yes
WPA- PEAP	Yes	Yes	Yes

Determining the Active Print Server

Most printers can have wired and wireless print servers installed at the same time. However, only one of the installed print servers can be active at any given time.

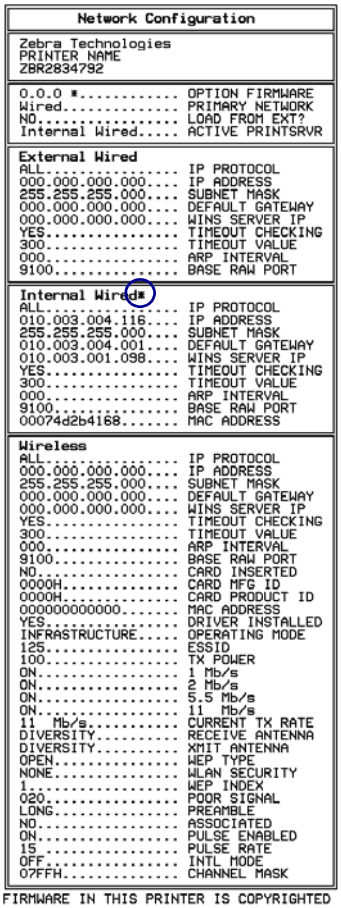
Viewing IP Addresses and the Active Print Server

The wired and wireless print servers have different IP addresses. The printer's control panel displays the IP address of the active print server (see *View Wireless Status through the Control Panel* *on page 27*). You can view the printer's web pages and send label formats to the printer through the active print server's IP address.

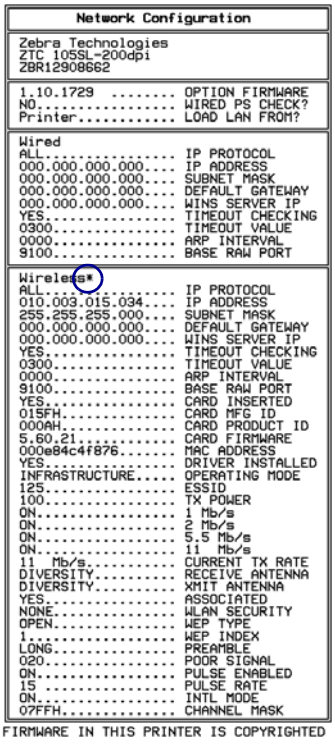
The network configuration label (Figure 3) displays the IP address of all installed print server devices and indicates the active print server with an asterisk (circled in Figure 3). To print a network configuration label, see *Print Network Configuration Information* *on page 29*.

Figure 3 • Active Print Sever on Network Configuration Label

Xi4, R110Xi4, ZM400, ZM600, RZ400, RZ600



Other Printers/ Print Engines



◯ = Active Print Server

Active Device Selection

Your active print server selection is dependent on the model of printer or print engine that you have.

If your printer is a(n)…	Then…
• S4M	Only one print server (wired or wireless) can be installed at a time. Thus, the print server installed is the primary print server.
• 105*SL* • *Xi*III*Plus* • R110*Xi* • R170*Xi* • Z4Mplus • Z6Mplus • *PAX4* • R110*PAX4*	You may select which installed device is the primary network device. The printer will try to use the primary network device as the active print server before trying the other installed options. These printers and print engines use X60.16.x firmware. The default for the printer is to skip the check for a wired print server during bootup. This makes the wireless print server the primary network device. To change this default and allow the wired print server to be the primary network device when it is connected, use one of the following methods to tell the printer to check for a wired print server at bootup time: • the WIRED PS CHECK parameter on the control panel • the ^NB ZPL command Table 8 identifies which device becomes the active print server under various conditions.
• Xi4 • R110Xi4 • ZM400 • ZM60 • RZ400 • RZ600	These printers support the simultaneous installation of an internal wired, external wired, and a wireless print server. Even though all three print servers may be installed, only one is connected to the network and is the active print server. Table 9 outlines priorities and identifies which device becomes the active print server when multiple print servers are installed. You may select whether the wired or wireless print server will be the primary connection by using one of the following methods: • the PRIMARY NETWORK parameter on the control panel • the ^NC ZPL command

Table 8 • Results of Check for Wired Print Server for 105*SL*, *Xi*III*Plus*, Z4Mplus, Z6Mplus, and *PAX*4 Series Printers

If the Check for Wired Print Server is set to:	Installed and Connected to a Live Ethernet Network		Then the Active Print Server will be:
	Wired	Wireless*	
Skip	X	X	Wireless
	X		Wired
		X	Wireless
Check	X	X	Wired
	X		Wired
		X	Wireless

* NOTE: A wireless option board must have an active radio that can properly associate to an access point.

Table 9 • Active Print Server Matrix for Xi4, R110Xi4, ZM400, ZM600, RZ400, and RZ600 Printers

If the Primary Network is set to:	Installed and Connected to a Live Ethernet Network			Then the Active Print Server will be:
	Internal Wired	External Wired	Wireless*	
Wired	X	X	X	Internal Wired
		X	X	External Wired
			X	Wireless
Wireless	X	X	X	Wireless
	X	X		Internal Wired
		X		External Wired

* NOTE: A wireless option board must have an active radio that can properly associate to an access point.

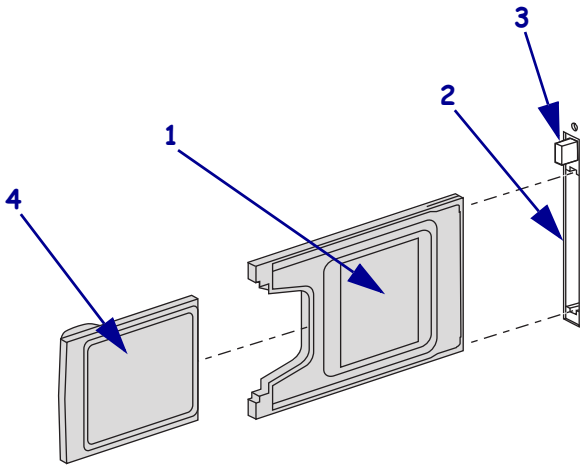
Install a Wireless Radio Card or Compact Flash Wireless Radio Card

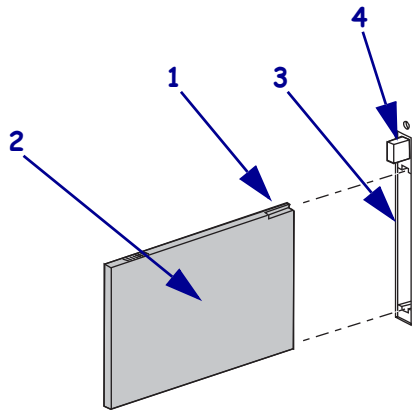
Note • The ZebraNet Internal Wireless Print Server has a built-in wireless radio card. This section applies only to the ZebraNet Wireless Print Server and the ZebraNet Wireless Plus Print Server.

Printers that have the wireless option board installed can use any of the wireless radio cards or Compact Flash wireless radio cards listed in *Supported Wireless Radio Cards* on page 15. This section provides instructions for installing either type of card. Most printers use a clear plastic RF cover over the wireless radio card or compact Flash wireless radio card.

To install a wireless radio card, complete these steps:

1. Turn off (**O**) the printer.
2. Remove and discard the metal cover that was shipped in place over the wireless option card slot on the back of the printer.
3. Install the card as shown.

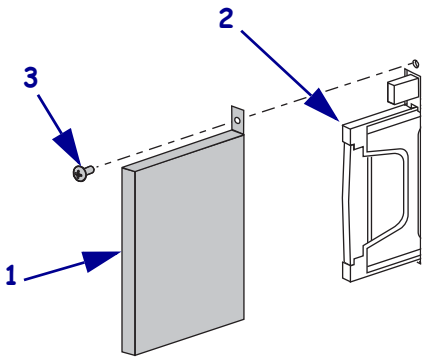
If you are installing...	Then…
Compact Flash radio cards	**a.** Position the adapter (**1**) with the back facing as shown. Insert the adapter into the wireless option card slot (**2**) on the back of the printer until the card-eject button (**3**) pops out. **b.** Insert the Compact Flash wireless radio card (**4**) into the adapter. 

If you are installing...	Then…
Other radio cards	**a.** Position the notch (**1**) on the wireless radio card (**2**) on the top, leading edge. **b.** Insert the wireless radio card into the wireless option card slot (**3**) on the back of the printer until the card-eject button (**4**) pops out. 

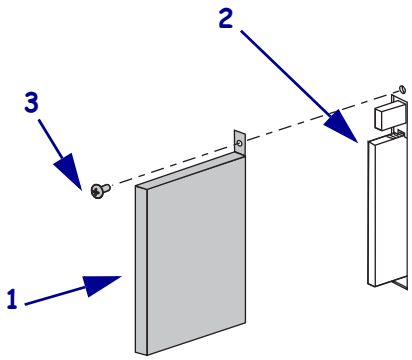
4. Place the RF card cover (**1**) over the wireless radio card (**2**), and secure it with a small screw (**3**).

Note • The S4M, ZM400, ZM600, RZ400, and RZ600 printers do not use the RF card cover.

Compact Flash Radio Cards



Other Radio Cards



5. Turn on (**I**) the printer.

   The printer restarts and uses the wireless radio card to communicate with your WLAN. Allow several minutes for the printer to connect to the network. For more information about wireless status, refer to *View Wireless Status through the Control Panel* *on page 27* or *Troubleshooting* *on page 41*.

Notes • _____

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2 Wireless Status and Settings

This section presents several options for viewing or modifying the wireless status and settings.

You may also use:

- the printer web pages (see *WebView Web Pages* *on page 47*)
- the ZPL commands
- the Set/Get/Do commands

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Configuration

Important • A wireless option board must be installed on your printer before you can configure the printer to communicate using a wireless radio card. See *Hardware* on page 12 to determine if your printer has a wireless board. See *Firmware* on page 13 for the required firmware versions and any other restrictions.

You may configure your printer for wireless operation in the following ways:

Through the Network Setup Wizard. The Network Setup Wizard is part of the ZebraNet™ Bridge Enterprise utility. The Network Setup Wizard writes a script for you. On the last screen of the wizard, you may choose to send the script directly to your printer, or you may choose to save the script to a file. The saved file has several purposes:

- The file can be sent to the printer through any available connection (serial, parallel, USB, or wired print server).
- The file can be resent to the printer after the network settings have been restored to factory defaults.
- The file can be sent to multiple printers that will use the same network settings.

Note • To configure wired and wireless print servers on the same printer, run the program once for each print server, creating a script for the wired print server and another for the wireless print server.

The ZebraNet Bridge Enterprise utility resides on the User CD for your printer and is available through http://www.zebra.com/software. ZebraNet Bridge Enterprise version 1.2.5 or later is required to configure the printer correctly for use.

Through ZPL script that you write. Use the `^WX` command to set the basic parameters for security type. You can send the command through any available connection (serial, parallel, USB, or wired print server).

Refer to the *Programming Guide for ZPL, ZBI, Set-Get-Do, Mirror, and WML* for more information. A copy of the manual is available at http://www.zebra.com/manuals or on the user CD that came with your printer.

Through Set/Get/Do (SGD) commands. Begin with `wlan.security` to set the wireless security type. Depending on which security type that you select, other SGD commands will be necessary to specify other parameters. You can send the commands through any available connection (serial, parallel, USB, or wired print server).

Refer to the *Programming Guide for ZPL, ZBI, Set-Get-Do, Mirror, and WML* for more information. A copy of the manual is available at http://www.zebra.com/manuals or on the user CD that came with your printer.

Note • With printers running EPL firmware, the only way to configure wireless settings is through SGD commands.

View Wireless Status through the Control Panel

After the wireless print server is configured, you may view the wireless status on the printer's control panel. Printers with an LCD display text or symbols (see *LCD Link Status and Wireless Signal Indicators*). The HC100 printer does not have an LCD, so the wireless status is indicated by the control panel lights (see *HC100 Wireless Status Indicator Lights* on page 28).

Note • Refer to the user guide for your printer for specific instructions on how to use the control panel.

LCD Link Status and Wireless Signal Indicators

This section applies to printers and print engines other than the HC100 printer.

Link Status Indicator The wireless link status indicator appears at the bottom left of the LCD, providing a real-time display of the printer's network status (Table 10).

Table 10 • Link Status Indicators

Status Indicator	Meaning
cycling through characters . o 0	The wireless radio card is associated with the WLAN.
underscore _	• The wireless radio card is not associated with the WLAN. Verify that your printer's wireless settings match those of the WLAN. • The firmware on the wireless radio card may need to be updated. See *Supported Wireless Radio Cards* on page 15 for the required firmware versions.
blank	• The printer is checking for a wired print server. • The printer is running a wired print server. • The wireless print server board is not installed or not installed correctly.

Wireless Signal Indicators Depending on which printer/print engine you are using, press the following key to access and scroll through the wireless signal indicators on the LCD:

- The right oval for the *PAX*4, RPAX4, RXi, RXi HF, and the *Xi*IIIPlus printers/print engines
- Plus (+) for the 105*SL*, RZ400, RZ600, Xi4, R110Xi4, ZM400, and ZM600 printers
- Plus (+) for the R4Mplus, Z4Mplus, and Z6Mplus printers (supported configurations only)
- The up arrow for the S4M printer

Table 11 shows the control panel indicators and messages that are associated with the wireless signal.

Table 11 • Wireless Signal Indicators

Wireless Signal Indicator	Description
SIGNAL STRENGTH and SIGNAL QUALITY	When these indicators display percentages, the wireless radio card is communicating with the network. The higher the number is, the better the connection is between the printer and the network. If your printer indicates a signal strength but you cannot communicate with the printer from your computer, move the printer to a different location to try to get a better signal strength or signal quality. This situation could also indicate that the printer is associated with, but not authenticated with, your access point.
NOISE LEVEL	This number indicates any electrical interference with the wireless signal. If your printer cannot communicate with the network and the noise level is high, move the printer to a location that is free of interference.

HC100 Wireless Status Indicator Lights

Table 12 shows the wireless status indicator lights for the HC100 printer.

Table 12 • Wireless Status Indicator Lights

Wireless Status Indicator	Meaning
Steady Green	The printer is associated with a wireless network. The signal strength is strong.
Flashing Green	The printer is NOT associated with a wireless network. The signal strength is strong.
Steady Orange	The printer is associated with a wireless network. The signal strength is weak.
Flashing Orange	The printer is NOT associated with a wireless network. The signal strength is weak.

Print Network Configuration Information

Most printers and print engines list the print server settings on a network configuration label. The HC100 printer lists the print server settings on a printer configuration wristband.

Network Configuration Label

A network configuration label lists the settings for the print servers installed in your printer. If a particular type of print server is not installed, the IP information for that print server appears as all zeroes (`000.000.000.000`). The active print server is indicated by an asterisk (see *Determining the Active Print Server* on page 19 for more information).

To print a network configuration label, complete these steps:

1. From the control panel, enter Setup mode.

Note • Refer to the User Guide for your printer for specific instructions on how to use the control panel.

2. Scroll to **LIST NETWORK** (level 3 parameter **PRINT OUT NETWORK** on the S4M printer).

3. Confirm printing.

   A network configuration label prints (Figure 4).

Figure 4 • Sample Network Configuration Label

Xi4, R110Xi4, ZM400, ZM600, RZ400, RZ600

```
Network Configuration

Zebra Technologies
PRINTER NAME
ZBR2834792

0.0.0 *.............. OPTION FIRMWARE
Wired................ PRIMARY NETWORK
NO................... LOAD FROM EXT?
Internal Wired..... ACTIVE PRINTSRVR

External Wired
ALL.................. IP PROTOCOL
000.000.000.000.... IP ADDRESS
255.255.255.000.... SUBNET MASK
000.000.000.000.... DEFAULT GATEWAY
000.000.000.000.... WINS SERVER IP
YES.................. TIMEOUT CHECKING
300.................. TIMEOUT VALUE
000.................. ARP INTERVAL
9100................. BASE RAW PORT

Internal Wired*
ALL.................. IP PROTOCOL
010.003.004.116.... IP ADDRESS
255.255.255.000.... SUBNET MASK
010.003.004.001.... DEFAULT GATEWAY
010.003.001.098.... WINS SERVER IP
YES.................. TIMEOUT CHECKING
300.................. TIMEOUT VALUE
000.................. ARP INTERVAL
9100................. BASE RAW PORT
00074d2b4168....... MAC ADDRESS

Wireless
ALL.................. IP PROTOCOL
000.000.000.000.... IP ADDRESS
255.255.255.000.... SUBNET MASK
000.000.000.000.... DEFAULT GATEWAY
000.000.000.000.... WINS SERVER IP
YES.................. TIMEOUT CHECKING
300.................. TIMEOUT VALUE
000.................. ARP INTERVAL
9100................. BASE RAW PORT
NO................... CARD INSERTED
0000H................ CARD MFG ID
0000H................ CARD PRODUCT ID
000000000000....... MAC ADDRESS
YES.................. DRIVER INSTALLED
INFRASTRUCTURE..... OPERATING MODE
125.................. ESSID
100.................. TX POWER
ON................... 1 Mb/s
ON................... 2 Mb/s
ON................... 5.5 Mb/s
ON................... 11  Mb/s
11  Mb/s............ CURRENT TX RATE
DIVERSITY.......... RECEIVE ANTENNA
DIVERSITY.......... XMIT ANTENNA
OPEN................. WEP TYPE
NONE................. WLAN SECURITY
1.................... WEP INDEX
020.................. POOR SIGNAL
LONG................. PREAMBLE
NO................... ASSOCIATED
ON................... PULSE ENABLED
15................... PULSE RATE
OFF.................. INTL MODE
07FFH................ CHANNEL MASK
FIRMWARE IN THIS PRINTER IS COPYRIGHTED
```

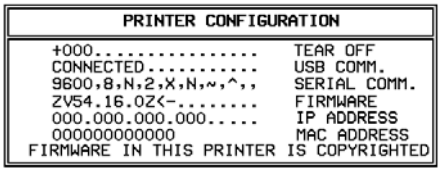
Other Printers/ Print Engines

```
Network Configuration

Zebra Technologies
ZTC 105SL-200dpi
ZBR12908662

1.10.1729  ........ OPTION FIRMWARE
NO................. WIRED PS CHECK?
Printer............ LOAD LAN FROM?

Wired
ALL................ IP PROTOCOL
000.000.000.000.... IP ADDRESS
000.000.000.000.... SUBNET MASK
000.000.000.000.... DEFAULT GATEWAY
000.000.000.000.... WINS SERVER IP
YES................ TIMEOUT CHECKING
0300............... TIMEOUT VALUE
0000............... ARP INTERVAL
9100............... BASE RAW PORT

Wireless*
ALL................ IP PROTOCOL
010.003.015.034.... IP ADDRESS
255.255.255.000.... SUBNET MASK
000.000.000.000.... DEFAULT GATEWAY
000.000.000.000.... WINS SERVER IP
YES................ TIMEOUT CHECKING
0300............... TIMEOUT VALUE
0000............... ARP INTERVAL
9100............... BASE RAW PORT
YES................ CARD INSERTED
015FH.............. CARD MFG ID
000AH.............. CARD PRODUCT ID
5.60.21............ CARD FIRMWARE
000e84c4f876....... MAC ADDRESS
YES................ DRIVER INSTALLED
INFRASTRUCTURE..... OPERATING MODE
125................ ESSID
100................ TX POWER
ON................. 1 Mb/s
ON................. 2 Mb/s
ON................. 5.5 Mb/s
ON................. 11  Mb/s
11  Mb/s.......... CURRENT TX RATE
DIVERSITY.......... RECEIVE ANTENNA
DIVERSITY.......... XMIT ANTENNA
YES................ ASSOCIATED
NONE............... WLAN SECURITY
OPEN............... WEP TYPE
1.................. WEP INDEX
LONG............... PREAMBLE
020................ POOR SIGNAL
ON................. PULSE ENABLED
15 ................ PULSE RATE
ON................. INTL MODE
07FFH.............. CHANNEL MASK
FIRMWARE IN THIS PRINTER IS COPYRIGHTED
```

HC100 Printer Configuration Wristband

An HC100 printer configuration wristband (Figure 5) shows the printer's connectivity settings. The IP ADDRESS and MAC ADDRESS fields will have values only if a wired or wireless print server is active.

Figure 5 • Sample Printer Configuration Wristband



To print a printer configuration wristband, complete these steps:

1. Make sure that the printer is on (**I**) and ready to print.
2. Press and hold PAUSE/FEED until the green lights turn off on the printer status indicator and the orange lights blink once.
3. Release PAUSE/FEED.

   A printer configuration wristband prints.

Wireless Network Parameters on the LCD

Note • The HC100 printer does not have an LCD. To view or change the wireless parameters, use the printer's web pages, ZPL commands, or SGD commands.

The control panel parameters are somewhat different for different printers. Refer to the user guide for your printer for specific instructions on how to modify the control panel parameters. To view wireless and network parameters that are not available as selections through the control panel, print a network configuration label.

The network parameters do not appear until after the printer recognizes the existence of a ZebraNet print server (wired or wireless). All zeroes (000.000.000.000) may display for some parameters until the printer obtains an IP address.

Wireless Password Some of the parameters can be password-protected by a wireless password. By default, the wireless print servers run in an "unprotected" mode (password set to **0000**), which means that you do not need to enter a wireless password through the control panel to view or modify wireless settings. To set a wireless password (not the same as the general printer password), use the `^WP` ZPL command or the `wlan.password` SGD command.

Xi4, R110Xi4, ZM400, ZM600, RZ400, and RZ600 Printers

Table 13 shows the wireless parameters that may be viewed or modified through the control panel on the Xi4, R110Xi4, ZM400, ZM600, RZ400, and RZ600 printers.

Table 13 • Wireless Parameters for Xi4, R110Xi4, ZM400, ZM600, RZ400, and RZ600 Printers

Parameter	Function
PRIMARY NETWORK	**Select the Primary Network Device** This parameter determines which device should be considered primary in the active device selection. See *Active Device Selection* on page 20 for more information. *Selections:* WIRED, WIRELESS *Default Value:* WIRED *Corresponding ZPL Command:* `^NC` *Corresponding SGD Command:* none
LOAD FROM EXT?	**View if IP Settings Are Loaded from the Printer or Print Server** This parameter tells whether to use the printer's or the print server's LAN/WLAN settings at boot time. The default is to use the printer's settings. *Selections:* YES, NO *Default Value:* NO *Corresponding ZPL Command:* `^NP` *Corresponding SGD Command:* none

Table 13 • Wireless Parameters for Xi4, R110Xi4, ZM400, ZM600, RZ400, and RZ600 Printers (Continued)

Parameter	Function
ACTIVE PRINTSRVR	**View the Active Print Server** This menu item displays which print server is being used. This tells which device's settings such as IP protocol and IP address are being displayed under those menu items. *Selections:* • WIRELESS indicates that the wireless device is active. • INTERNAL WIRED indicates that the internal 10/100 option board is active. • EXTERNAL WIRED indicates that the external print server is active. • NONE indicates that at least one of the network options is installed but none of them are active. When NONE is shown for this menu item, the device-specific items such as IP protocol and IP address will not display. *Default Value:* NONE *Corresponding ZPL Command:* none *Corresponding SGD Command:* none
IP PROTOCOL	**View or Change the IP Resolution Method** This parameter tells if the user (permanent) or the server (dynamic) selects the IP address. If a dynamic option is chosen, this parameter tells the method(s) by which the print server (wired or wireless) receives the IP address from the server. *Selections:* ALL, BOOTP, DHCP, DHCP AND BOOTP, PERMANENT *Default Value:* All *Corresponding ZPL Command:* ^ND *Corresponding SGD Command:* `wlan.ip.protocol`
IP ADDRESS	**View or Change the Printer's IP Address** This parameter can be modified only when **PERMANENT** is selected for **IP PROTOCOL**. *Selections:* 0 to 255 for each field *Default Value:* 0.0.0.0 displays while an IP address is being obtained, and then defaults to 192.168.254.254 if no IP address is obtained *Corresponding ZPL Command:* ^ND *Corresponding SGD Command:* `wlan.ip.addr`
SUBNET MASK	**View or Change the Subnet** This parameter can be modified only when **PERMANENT** is selected for **IP PROTOCOL**. *Selections:* 0 to 255 for each field *Default Value:* 255.255.255.0 *Corresponding ZPL Command:* ^ND *Corresponding SGD Command:* `ip.netmask`

Table 13 • Wireless Parameters for Xi4, R110Xi4, ZM400, ZM600, RZ400, and RZ600 Printers (Continued)

Parameter	Function
DEFAULT GATEWAY	**View or Change the Gateway** This parameter can be modified only when **PERMANENT** is selected for **IP PROTOCOL**. *Selections:* 0 to 255 for each field *Default Value:* 0.0.0.0 *Corresponding ZPL Command:* ^ND *Corresponding SGD Command:* ip.gateway
MAC ADDRESS	**View the Wireless Radio Card's MAC Address** Each wireless radio card has a permanent and unique Media Access Control (MAC) address assigned to it. This parameter shows the MAC address for the current wireless radio card. *Default Value:* 000000000000 *Corresponding ZPL Command:* none *Corresponding SGD Command:* card.mac_addr
ESSID	**View the ESSID Value** The Extended Service Set Identification (ESSID) is an identifier for your wireless network. This parameter shows the ESSID for the current wireless configuration. *Default Value:* 125 *Corresponding ZPL Command:* none *Corresponding SGD Command:* wlan.essid
WLAN SECURITY	**View the WLAN Security Type** This parameter displays the current security type. *Corresponding ZPL Command:* ^WX *Corresponding SGD Command:* wlan.security
RESET NETWORK	**Reset the Wired or Wireless Network** Use this parameter to reinitialize the wireless radio card and the print server (wired or wireless) when the wireless print server is running. This parameter also causes any wireless radio card in the printer to reassociate to the wireless network. *Corresponding ZPL Command:* ~WR *Corresponding SGD Command:* device.reset

S4M Printers

Table 14 shows the wireless parameters that may be viewed or modified through the S4M control panel.

Table 14 • Wireless Parameters for S4M Printers

Parameter	Explanation
Password Level 3 Parameters	
ACTIVE PRINTSRVR	**View the Active Print Server** This menu item displays which print server is being used. This tells which device's settings such as IP protocol and IP address are being displayed under those menu items. *Selections:* • WIRELESS indicates that the wireless device is active. • EXTERNAL WIRED indicates that the external print server is active. • NONE indicates that at least one of the network options is installed but none of them are active. When NONE is shown for this menu item, the device-specific items such as IP protocol and IP address will not display. *Default Value:* NONE *Corresponding ZPL Command:* none *Corresponding SGD Command:* none
OBTAIN IP ADDRESS	**Obtain an IP Address** Selects the method by which an IP address will be assigned to the printer. If you choose AUTO SELECT, you may specify a value for CHANGE IP PROTOCOL. *Selections:* AUTO SELECT (dynamic), PERMANENT (user-specified) *Default Value:* AUTO SELECT
CHANGE IP PROTOCOL	**View or Change the IP Resolution Method** Determines the method(s) by which the print server (wired or wireless) receives the IP address from the server. This parameter can be modified only when AUTO SELECT is selected for OBTAIN IP ADDRESS. *Selections:* ALL, GLEANING ONLY, RARP, BOOTP, DHCP, DHCP AND BOOT *Default Value:* ALL *Corresponding ZPL Command:* ^ND *Corresponding SGD Command:* wlan.ip.protocol

Table 14 • Wireless Parameters for S4M Printers (Continued)

Parameter	Explanation
CHANGE IP ADDRESS	**View or Change the Printer's IP Address** This parameter can be modified only when **PERMANENT** is selected for **OBTAIN IP ADDRESS**. *Selections:* 0 to 255 for each field *Default Value:* 0.0.0.0 displays while an IP address is being obtained, and then defaults to 192.168.254.254 if no IP address is obtained **Note •** Leading zeroes are not shown in the address. If an IP address contains more digits than can be displayed at one time, use the left or right arrows to scroll through the digits. *Corresponding ZPL Command:* ^ND *Corresponding SGD Command:* wlan.ip.addr
CHANGE SUBNET	**View or Change the Subnet** This parameter can be modified only when **PERMANENT** is selected for **OBTAIN IP ADDRESS**. *Selections:* 0 to 255 for each field *Default Value:* 0.0.0.0 **Note •** Leading zeroes are not shown in the address. If an IP address contains more digits than can be displayed at one time, use the left or right arrows to scroll through the digits. *Corresponding ZPL Command:* ^ND *Corresponding SGD Command:* ip.netmask
CHANGE GATEWAY	**View or Change the Gateway** This parameter can be modified only when **PERMANENT** is selected for **OBTAIN IP ADDRESS**. *Selections:* 0 to 255 for each field *Default Value:* 0.0.0.0 **Note •** Leading zeroes are not shown in the address. If an IP address contains more digits than can be displayed at one time, use the left or right arrows to scroll through the digits. *Corresponding ZPL Command:* ^ND *Corresponding SGD Command:* ip.gateway
Password Level 4 Parameters	
MAC ADDRESS [1]	**View the Wireless Radio Card's MAC Address** Each wireless radio card has a permanent and unique Media Access Control (MAC) address assigned to it. This parameter shows the MAC address for the current wireless radio card. *Default Value:* 000000000000 *Corresponding ZPL Command:* none *Corresponding SGD Command:* card.mac_addr

Table 14 • Wireless Parameters for S4M Printers (Continued)

Parameter	Explanation
ESSID[1]	**View the ESSID Value** The Extended Service Set Identification (ESSID) is an identifier for your wireless network. This parameter shows the ESSID for the current wireless configuration. *Default Value:* 125 *Corresponding ZPL Command:* none *Corresponding SGD Command:* `wlan.essid`
WLAN SECURITY[1]	**View the WLAN Security Type** This parameter displays the current security type. *Corresponding ZPL Command:* `^WX` *Corresponding SGD Command:* `wlan.security`
RESET NETWORK[1]	**Reset the Wired or Wireless Network** Use this parameter to reinitialize the wireless radio card and the print server (wired or wireless) when the wireless print server is running. This parameter also causes any wireless radio card in the printer to reassociate to the wireless network. *Corresponding ZPL Command:* `~WR` *Corresponding SGD Command:* `device.reset`

Other Printer Models

Table 15 shows the wireless parameters that may be viewed or modified through the control panel on the following printers:

- Non-RFID—105*SL*, *PAX*4, *Xi*III*Plus*, Z4Mplus, Z6Mplus
- RFID—R110*PAX*4, R4Mplus, R110*Xi*, R170*Xi*, R110*Xi* HF

Printers with older versions of firmware have a different set of parameters. For those parameters, refer to the *ZebraNet Wireless Print Server User Guide*. You may download firmware V60.15.x, R6x.15.x, or later to access the newer encryption features. Go to http://www.zebra.com/firmware for firmware download options.

Table 15 • Wireless Parameters for Other Printer Models

Parameter	Function
WIRED PS CHECK?	**View if the Printer Checks for a Wired Print Server at Bootup** This parameter tells if the printer searches for a wired print server at bootup. *Selections:* YES, NO *Default Value:* NO *Corresponding ZPL Command:* ^NB *Corresponding SGD Command:* none
LOAD LAN FROM?	**View if IP Settings Are Loaded from the Printer or Print Server** This parameter, which serves the same function as the ^NP ZPL command, tells if the printer uses IP settings from the printer or the print server at bootup. *Selections:* PRINTER, PRINTSERVER *Default Value:* PRINTER *Corresponding ZPL Command:* ^NP *Corresponding SGD Command:* none
ACTIVE PRINTSRVR	**View the Active Print Server** This menu item displays which print server is being used. This tells which device's settings such as IP protocol and IP address are being displayed under those menu items. *Selections:* • WIRELESS indicates that the wireless device is active. • EXTERNAL WIRED indicates that the external print server is active. • NONE indicates that at least one of the network options is installed but none of them are active. When NONE is shown for this menu item, the device-specific items such as IP protocol and IP address will not display. *Default Value:* NONE *Corresponding ZPL Command:* none *Corresponding SGD Command:* none

Table 15 • Wireless Parameters for Other Printer Models (Continued)

Parameter	Function
IP PROTOCOL	**View or Change the IP Resolution Method** This parameter tells if the user (permanent) or the server (dynamic) selects the IP address. If a dynamic option is chosen, this parameter tells the method(s) by which the print server (wired or wireless) receives the IP address from the server. *Selections:* ALL, BOOTP, DHCP, DHCP AND BOOTP, PERMANENT *Default Value:* All *Corresponding ZPL Command:* ^WI *Corresponding SGD Command:* wlan.ip.protocol
IP ADDRESS	**View the Printer's IP Address** This parameter can be modified only when **PERMANENT** is selected for **IP PROTOCOL**. *Default Value:* 0.0.0.0 displays while an IP address is being obtained, and then defaults to 192.168.254.254 if no IP address is obtained *Corresponding ZPL Command:* ^WI *Corresponding SGD Command:* wlan.ip.addr
SUBNET MASK	**View the Subnet** This parameter can be modified only when **PERMANENT** is selected for **IP PROTOCOL**. *Default Value:* 255.255.255.0 *Corresponding ZPL Command:* ^ND *Corresponding SGD Command:* ip.netmask
DEFAULT GATEWAY	**View the Gateway** This parameter can be modified only when **PERMANENT** is selected for **IP PROTOCOL**. *Default Value:* 0.0.0.0 *Corresponding ZPL Command:* ^WI *Corresponding SGD Command:* ip.gateway
MAC ADDRESS[1]	**View the Wireless Radio Card's MAC Address** Each wireless radio card has a permanent and unique Media Access Control (MAC) address assigned to it. This parameter shows the MAC address for the current wireless radio card. *Default Value:* 000000000000 *Corresponding ZPL Command:* none *Corresponding SGD Command:* card.mac_addr

Table 15 • Wireless Parameters for Other Printer Models (Continued)

Parameter	Function
ESSID[1]	**View the ESSID Value** The Extended Service Set Identification (ESSID) is an identifier for your wireless network. This parameter shows the ESSID for the current wireless configuration. *Default Value:* 125 *Corresponding ZPL Command:* none *Corresponding SGD Command:* `wlan.essid`
WLAN SECURITY[1]	**View the WLAN Security Type** This parameter displays the current security type. *Corresponding ZPL Command:* `^WX` *Corresponding SGD Command:* `wlan.security`
RESET NETWORK[1]	**Reset the Wired or Wireless Network** Use this parameter to reinitialize the wireless radio card and the print server (wired or wireless) when the wireless print server is running. This parameter also causes any wireless radio card in the printer to reassociate to the wireless network. *Corresponding ZPL Command:* `~WR` *Corresponding SGD Command:* `device.reset`

Restore Network Parameters to Defaults

You may need to restore the network parameters to the factory defaults under the following circumstances:

- If you download a different version of firmware to your printer
- If you need to reset the encryption keys (for instances where a key was entered incorrectly or was forgotten)

After you return the network parameters to the defaults, you must reconfigure your printer to use the wireless print server (see *Configuration* on page 26). If you saved the ZPL script generated by the Wireless Setup Wizard, simply send this file to the printer, and then power cycle the printer. If you were using a wireless password, you must set it again (use the `^WP` ZPL command or the `wlan.password` SGD command).

You can set the network parameters back to the factory defaults in two ways:

- The **Restore Default Network Configuration** button on the printer's View and Modify Printer Settings Page (see Figure 7 on page 51).
- The `DEFAULT NET` option, which appears as an option when you exit Setup mode on most printer models. Refer to the user guide for your printer for specific instructions on how to modify the control panel parameters.

Note • The `LOAD DEFAULTS` option and the **Restore Default Configuration** button reset all printer parameters other than network settings back to factory defaults. The network settings will not change when these options are selected.

3 Troubleshooting

This section provides solutions to problems related specifically to the wireless print servers.

For print quality or other printer-specific problems, refer to the troubleshooting section in the user guide for your printer. For problems with the wireless radio card or access point not addressed here, refer to the appropriate third-party documentation.

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General Issues 43
Encryption and Authentication Issues 45
IP Issues 46

Wireless Error Messages

Table 16 shows error messages that may appear on the control panel.

Table 16 • Error Messages

Message	Description
NO CARD INSERTED	The wireless radio card is not inserted at all or is not fully seated.
NOT ASSOCIATED	The wireless radio card is present but cannot log on to the network.
NOT AUTHENTICATD	The wireless radio card is present and associated with the access point, but it has not been authenticated by the authentication server.
RADIO WARNING POOR SIGNAL	The wireless signal strength has dropped below the poor signal threshold value, which is set through the Wireless Setup web page (see *Wireless Setup* *on page 60*). **Note** • The poor signal setting affects when you see the POOR SIGNAL warning, but it does not affect whether your printer will be able to associate with your network at a low signal strength.

General Issues

Table 17 • General Issues and Recommended Solutions

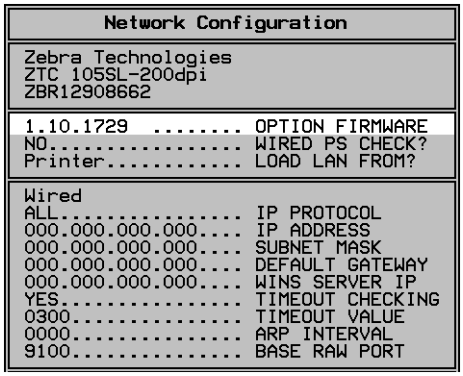
Issue	Possible Cause	Recommended Solution
The printer acknowledges the wireless radio card and indicates a signal strength, but the printer does not appear to connect to the network.	The combination of signal strength and signal quality at the printer may not be good enough to establish a connection to the network.	Move the printer or the access point to another location, or remove any obstructions between the two. A direct line of site between the printer and access point provides the best results. Refer to the third-party documentation for your access point for additional recommendations and limitations.
	The printer is associated with, but not authenticated with, your access point.	1. Check your encryption settings. 2. Verify that your MAC address is approved for the access point.
	The option board firmware may not be compatible with the wireless print server that you have installed.	1. Go to go to http://www.zebra.com/firmware. 2. Find the release notes that are bundled with the latest firmware for your printer. 3. In the release notes, locate the option board firmware version. 4. Print a network configuration label (see *Network Configuration Label* on page 29). 5. On the network configuration label, find the `OPTION FIRMWARE` line.  6. Compare the value shown for `OPTION FIRMWARE` with the value shown in the release notes. 7. If necessary, download the latest printer firmware version to also update the option board firmware. 8. If the problem persists, contact Technical Support.

Table 17 • General Issues and Recommended Solutions (Continued)

Issue	Possible Cause	Recommended Solution
The printer does not acknowledge the wireless radio card.	The card may not be inserted correctly.	Make sure that the wireless radio card is correctly seated in the wireless option card slot.
	Your printer may not be equipped with a ZebraNet wireless print server.	See *Hardware* on page 12 to determine if you have a wireless print server installed. Contact your authorized Zebra representative for information about purchasing this option.
	The card may not be supported for use with the ZebraNet wireless print servers.	Make sure that you are using a compatible wireless radio card (see *Supported Wireless Radio Cards* on page 15).
After a firmware upgrade, the printer will not connect to the network.	Network settings need to be updated.	1. Through the printer's control panel, press SETUP/EXIT to enter Setup mode. 2. Press SETUP/EXIT again to access the printer's save and default options. 3. Scroll to **DEFAULT NET**. 4. Press SETUP/EXIT. The network settings are returned to factory defaults. 5. Reconfigure your printer to use the ZebraNet wireless print server (see *Configuration* on page 26). If you saved the ZPL script generated by the ZebraNet Bridge Wireless Setup Wizard utility, simply send this file to the printer. If you were using a wireless password, you need to set it again (use the ^WP ZPL command or the `wlan.password` SGD command). 6. Power cycle the printer for the settings to take effect.
My wireless connection is inconsistent. The signal strengths change back and forth between high and low numbers.	An access point may be bad. The card appears to be switching affiliations between access points.	Check the access points on your WLAN, particularly the one closest to the printer.
	The wireless radio card is repeatedly associating with two or more access points because of varying signal strengths.	Check the access points on your WLAN to determine what is causing the signal strengths to vary.

Encryption and Authentication Issues

Table 18 • Encryption and Authentication Issues and Recommended Solutions

Issue	Possible Cause	Recommended Solution
The entry field for WEP keys on the printer's web page does not display all 26 characters.	The field accepts 26 characters, but they may not be able to display all at once because of your browser or system settings.	Use the left and right arrow keys on your keyboard to move the cursor in the WEP key field and reveal characters that may not display.
I set WEP encryption keys using the ^WX ZPL command, and now my wireless print server does not function.	The ZPL script that you sent to the printer may have been incorrect. The printer may be using the wrong encryption key or looking for one that is undefined.	Resend the ^WX command. Make sure that all of the required commas are in place in the command. A missing or extra comma in this command can prevent the printer from joining the wireless network.
I set WEP encryption keys using the ^WE ZPL command, and now my wireless print server does not function.	The ZPL script that you sent to the printer may have been incorrect. The printer may be using the wrong encryption key or looking for one that is undefined.	Use the ^WX command instead of ^WE.
	You enabled WEP and WPA encryption modes at the same time.	Before enabling a new security type, disable any mode used previously. Use the ^WX command instead of ^WE to ensure that only one security type is enabled at a time.
I set WEP encryption keys using the wlan.wep.index Set/Get/Do command, and now my wireless print server does not function.	The command that you sent to the printer may have specified the index number for an encryption key that is undefined.	Resend the wlan.wep.index command with the index number for a defined encryption key.
WPA mode will not work.	The wireless radio card contains an outdated version of firmware.	Flash the latest firmware to the wireless radio card. Contact the card manufacturer for details.
Kerberos mode will not work.	You are using a wireless radio card that does not support Kerberos. Kerberos is available only with Symbol Technologies Spectrum24 wireless radio cards.	Switch to a Symbol Technologies Spectrum24 wireless radio card.
The printer will not connect to the WLAN.	You are using a wireless radio card that does not support the security type being used on your WLAN.	Switch to a wireless radio card that supports your security type. Check Table 5 on page 16 for the security types supported by different wireless radio cards.

IP Issues

Table 19 • IP Issues and Recommended Solutions

Issue	Possible Cause	Recommended Solution
The printer shows IP address 192.168.254.254, which does not appear to work.	IP address 192.168.254.254 is a default address. The printer shows this address after it times out while trying to connect. The printer was likely set to an incorrect static IP address.	Enter a valid static IP address. OR Set IP Protocol to All.
	The DHCP server is not functioning, so a dynamic IP address is not being assigned. The printer timed out and shows the default IP address of 192.168.254.254.	Check the DHCP server.
On my control panel, the IP settings are missing or show all zeroes (000.000.000.000).	Actual IP settings (IP Resolution, IP Address, Subnet Mask, and Default Gateway) will only appear when the printer is associated to and authenticated with the WLAN. Until the time that the printer recognizes the existence of a ZebraNet print server, these parameters will not show through the control panel. After the print server is recognized, all zeroes will display until the printer obtains an IP address or defaults to address 192.168.254.254.	1. Allow more time for the printer to complete its connection and obtain an IP address. 2. If the printer does not connect, check that there is an adequate signal between the printer and the access point. If necessary, move the printer or the access point to another location, or remove any obstructions between the two. A direct line of site between the printer and access point provides the best results. Refer to the third-party documentation for your access point for recommendations and limitations. 3. Check the IP Protocol setting. If using a static setting, the value entered might not be valid.
The IP address for my wired print server does not bring up the printer home page.	If both a wired and wireless print server are installed on a printer at the same time and the wireless printer is the primary/active print server, the printer web pages can be accessed only through the wireless print server's IP address.	In your browser window, type in the IP address of the wireless print server.

4

WebView Web Pages

This section provides details about the ZebraLink WebView web pages for a printer that is running a ZebraNet wireless print server.

Note • The web pages are available only on printers operating in ZPL mode. Printers operating in EPL mode do not have web pages.

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View and Modify Printer Settings 51
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Web Page Overview

ZebraLink WebView is a browser-based application that provides real-time configuration, control, and monitoring capabilities for your printer. The web pages display real-time information about the printer, including printer status, error conditions, and all printing parameters.

You can use the printer's web pages to view and modify many of the same parameters that appear on the printer's control panel. Through the printer's web pages, you can also enter additional WEP encryption keys and change other parameters that are not accessible through the control panel.

Home Page

The printer's home page is the first web page that opens. This page includes a menu of hyperlinks that allow you to make modifications to the printer, print server, and network settings. Other changeable settings through the home page include:

- Network Status, Error, and Warning reports
- Directories of objects stored in Flash memory and RAM devices
- Objects, stored fonts, images, programs, and ZPL II formats

To access the printer's home page, you need the printer's IP address. When the printer is connected to your WLAN, you can find the IP address using the printer's control panel.

Note • Refer to the user guide for your printer for specific instructions on how to use the control panel.

To access your printer's home page, complete these steps:

1. From the control panel, enter Setup mode.
2. Scroll through the parameters until you reach `IP ADDRESS`.
3. Write down the IP Address (do not include any leading zeroes).
4. Open a web browser window.

5. In the address box, type the IP address for the printer (do not include www or any leading zeroes), and then press Enter.

   The printer's home page displays.

For more information about the options listed on the printer home page, see the following sections:

- *View Printer Configuration* on page 50
- *View and Modify Printer Settings* on page 51
- *Directory Listing* on page 61
- *Alert Setup* on page 65
- *Printer Controls* on page 68
- *Print Server Settings* on page 70

View Printer Configuration

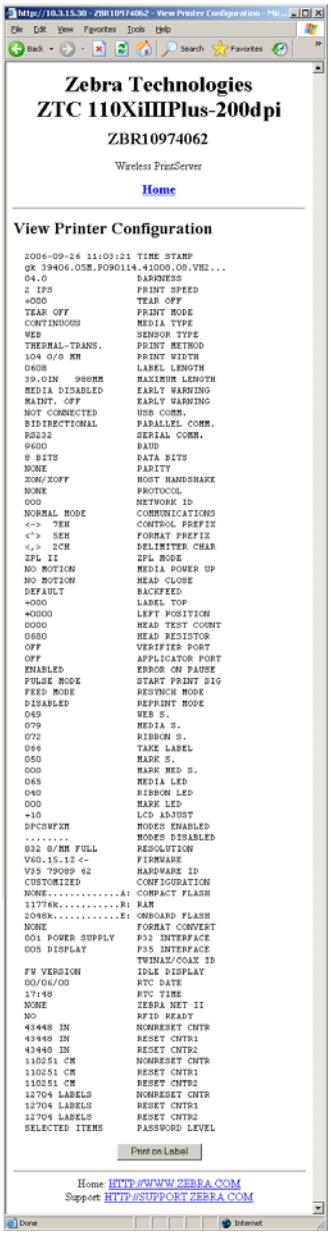
The View Printer Configuration menu option provides accurate, up-to-the-minute information on the printer's current state. An administrator can conveniently find information on the Virtual Configuration Label and also check on the status of printer ports.

To view the printer configuration through WebView, complete these steps:

1. From the printer home page, click **View Printer Configuration**.

   WebView displays the configuration settings (Figure 6).

Figure 6 • View Printer Configuration



2. To receive updated printer information from this view, refresh the browser page.

View and Modify Printer Settings

This section provides you with steps for accessing and modifying printer settings with a ZebraLink-enabled printer. It also provides illustrations of the various pages you can access.

To access the View and Modify Printer Settings, complete these steps:

1. From the printer home page, click **View and Modify Printer Settings**.

   The printer prompts you for a password.

2. Enter the password for your printer. The default password is **1234**.

3. Click **Submit Changes**.

   The following statement appears:

   Access Granted. This IP Address now has admin access to the restricted printer pages. Please Click here to proceed

4. Click on the statement.

   The View and Modify Printer Settings page displays (Figure 7). Table 20 on page 52 shows the screens that appear when you click on the menu selections on this page and describes some of the crucial items.

Figure 7 • View and Modify Printer Settings Page

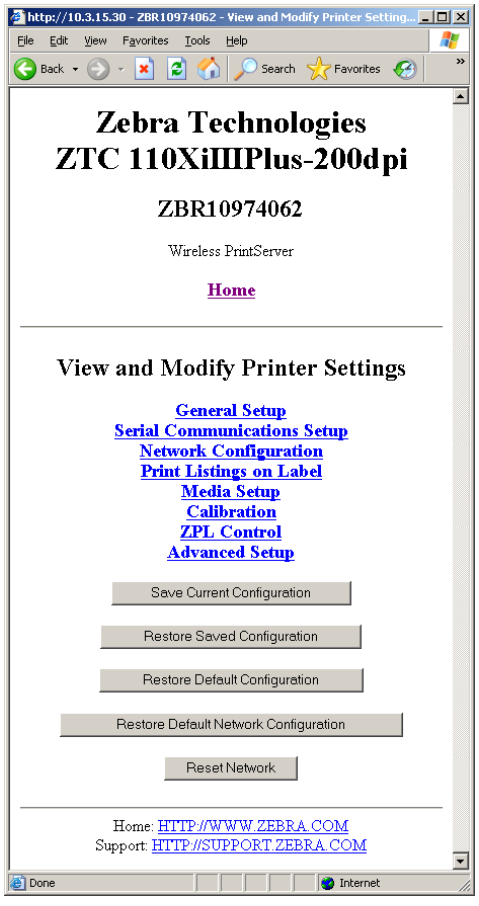
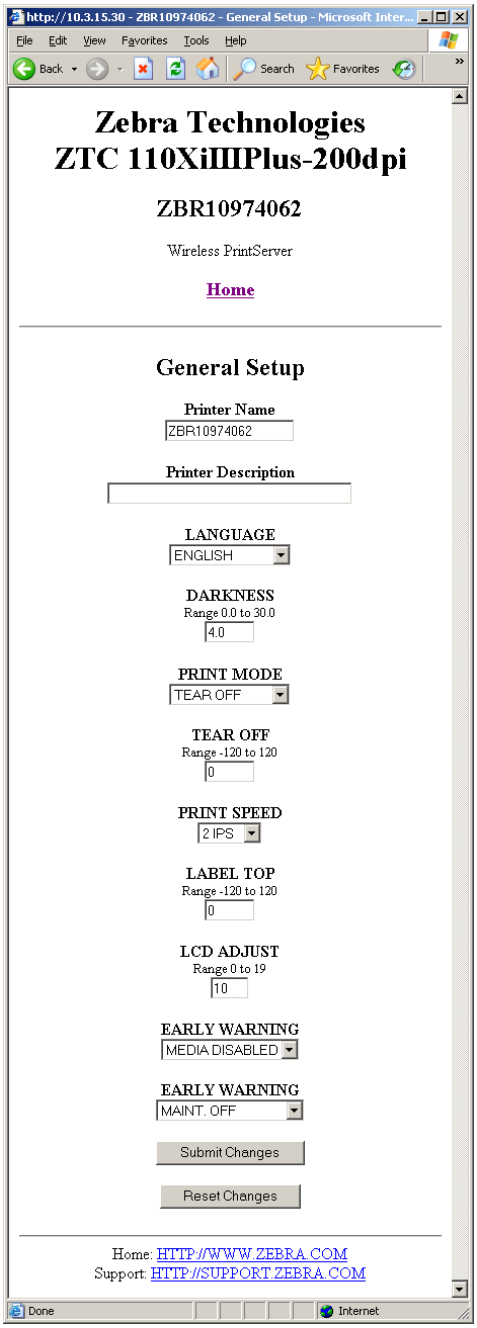


Table 20 • Subscreens: View and Modify Printer Settings Screen

General Setup



Serial Communications Setup

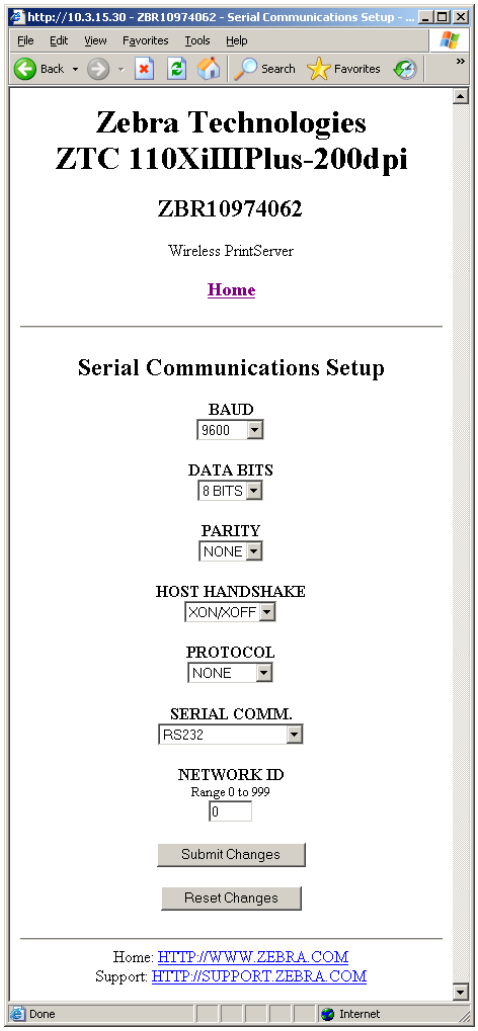
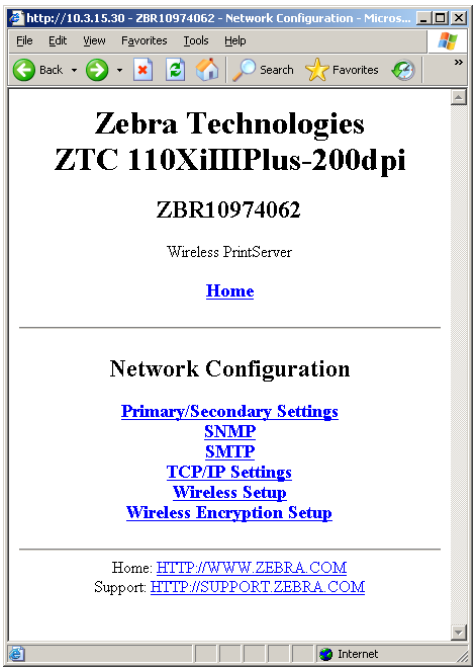


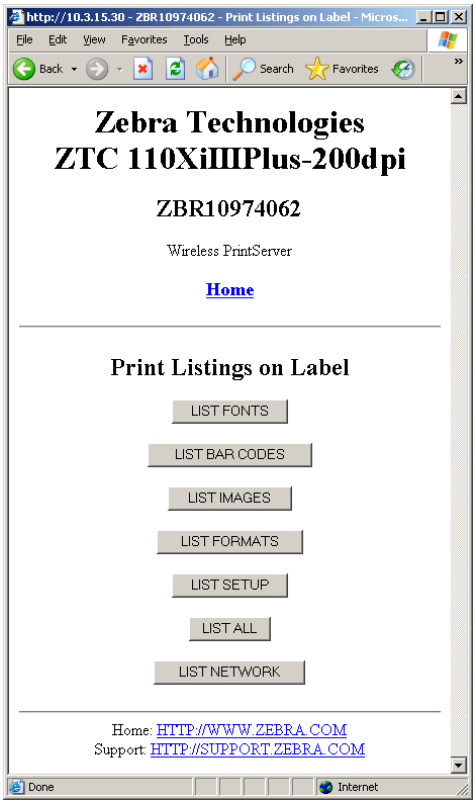
Table 20 • Subscreens: View and Modify Printer Settings Screen (Continued)

Network Configuration Menu

(see Table 21 on page 57 for subscreens)



Print Listings on Label



RFID Setup (RFID Printers/Print Engines only)

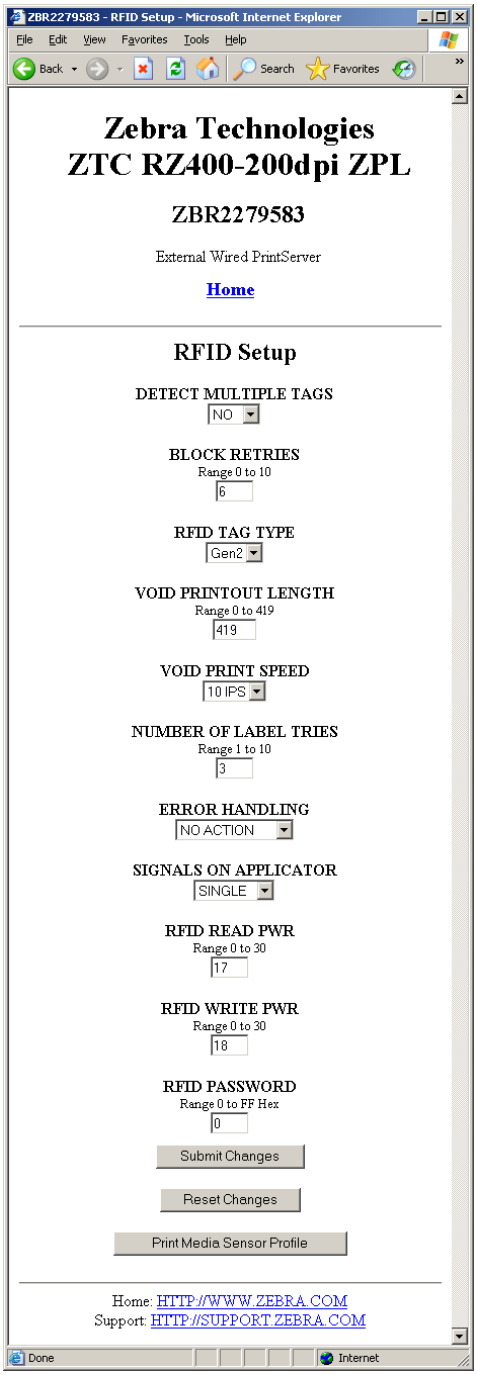
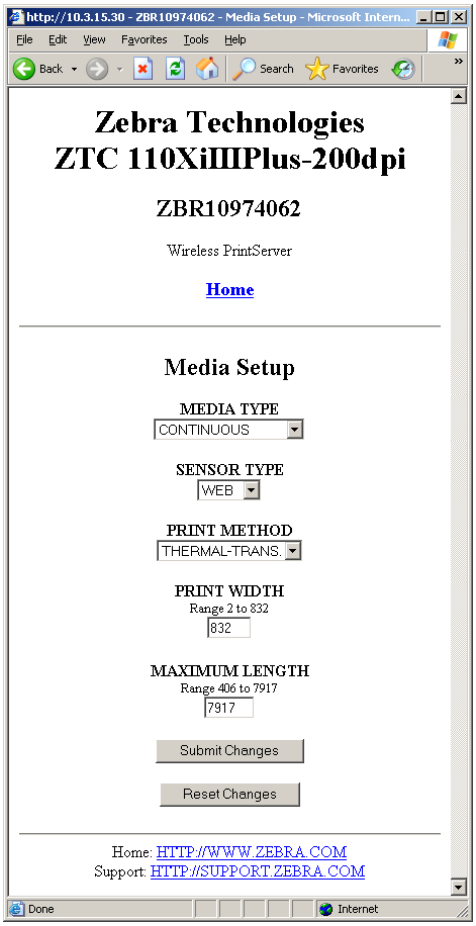


Table 20 • Subscreens: View and Modify Printer Settings Screen (Continued)

Media Setup



Calibration

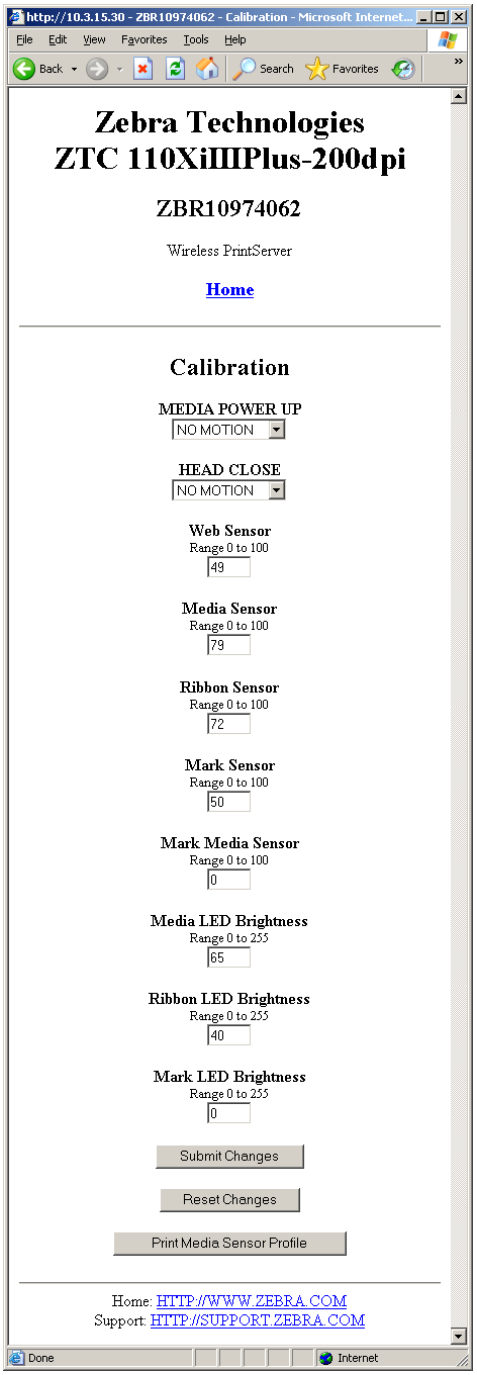
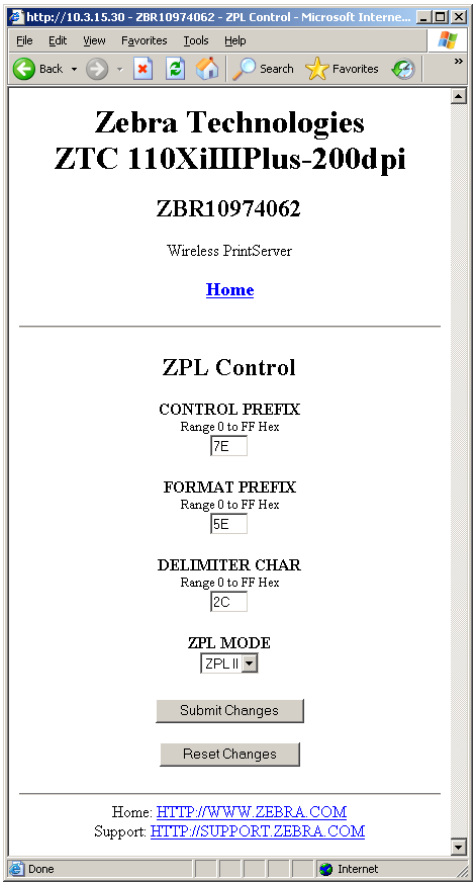
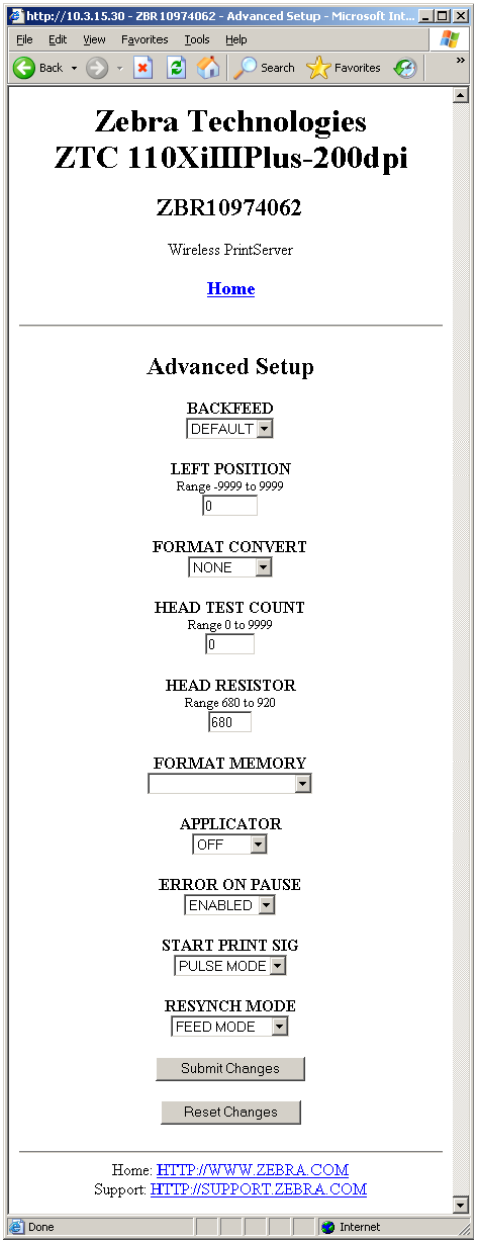


Table 20 • Subscreens: View and Modify Printer Settings Screen (Continued)

ZPL Control



Advanced Setup



Network Configuration Screens

This section shows the shows the screens that appear when you click on the menu items on the Network Configuration menu.

To access the Network Communications menu, complete these steps:

1. From the printer home page, click **View and Modify Printer Settings**.

   The printer prompts you for a password.

2. Enter the password for your printer. The default password is **1234**.

3. Click **Submit Changes**.

   The following statement appears:

   Access Granted. This IP Address now has admin access to the restricted printer pages. Please Click here to proceed

4. Click on the statement.

   The View and Modify Printer Settings page displays (see Figure 7 on page 51).

5. Click **Network Configuration**.

   The Network Configuration Menu displays. Table 21 shows the screens that appear when you click on the menu selections on this page and describes some of the items that may need clarification.

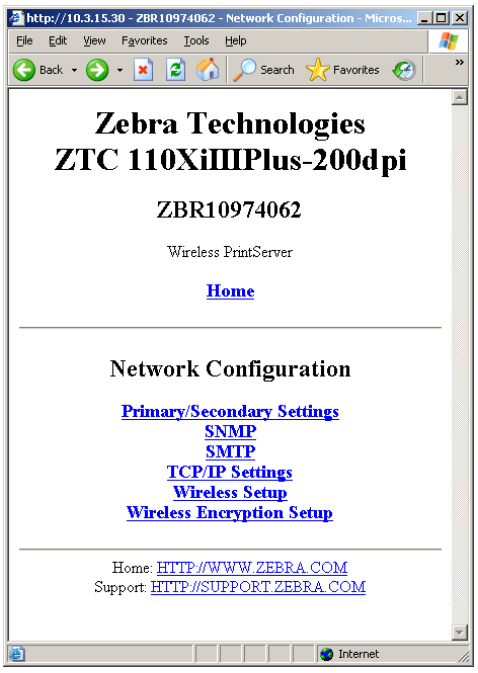
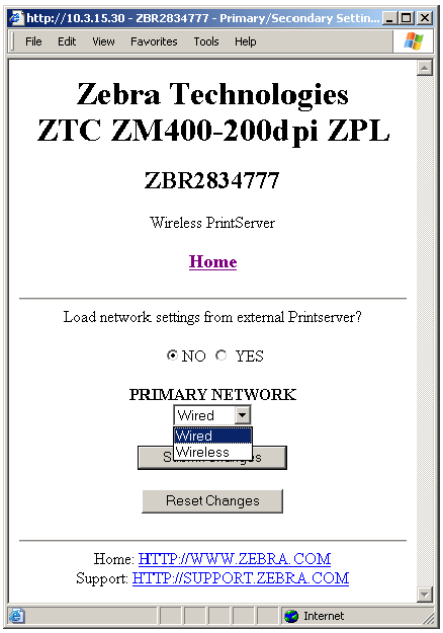


Table 21 • Subscreens: Network Communications Setup

Primary/Secondary Settings

Xi4, R110Xi4, ZM400, ZM600, RZ400, and RZ600



Other Printers

SNMP

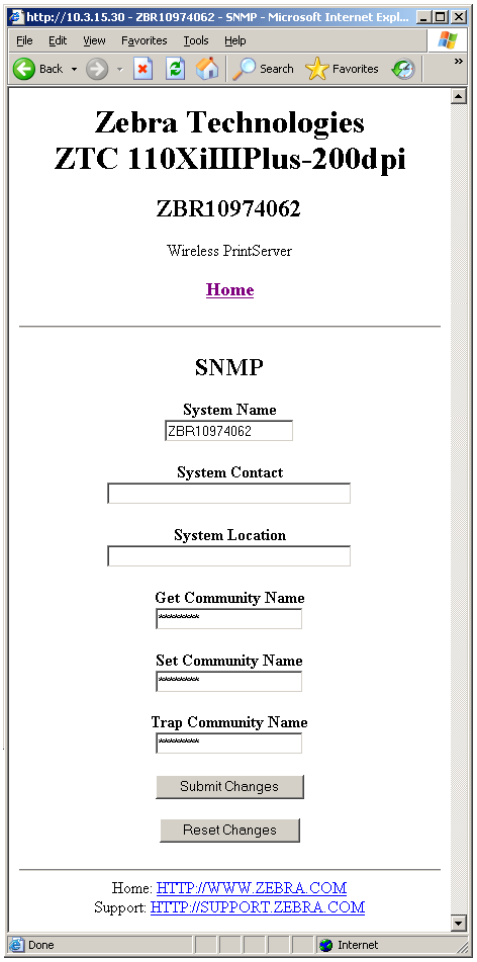
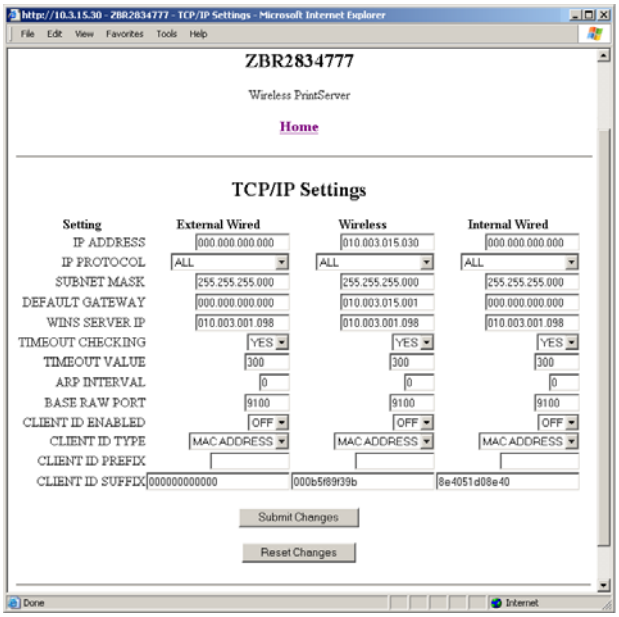


Table 21 • Subscreens: Network Communications Setup (Continued)

SMTP

Table 21 • Subscreens: Network Communications Setup (Continued)

TCP/IP
Xi4, R110Xi4, ZM400, ZM600, RZ400, and RZ600



TCP/IP
Other Printers

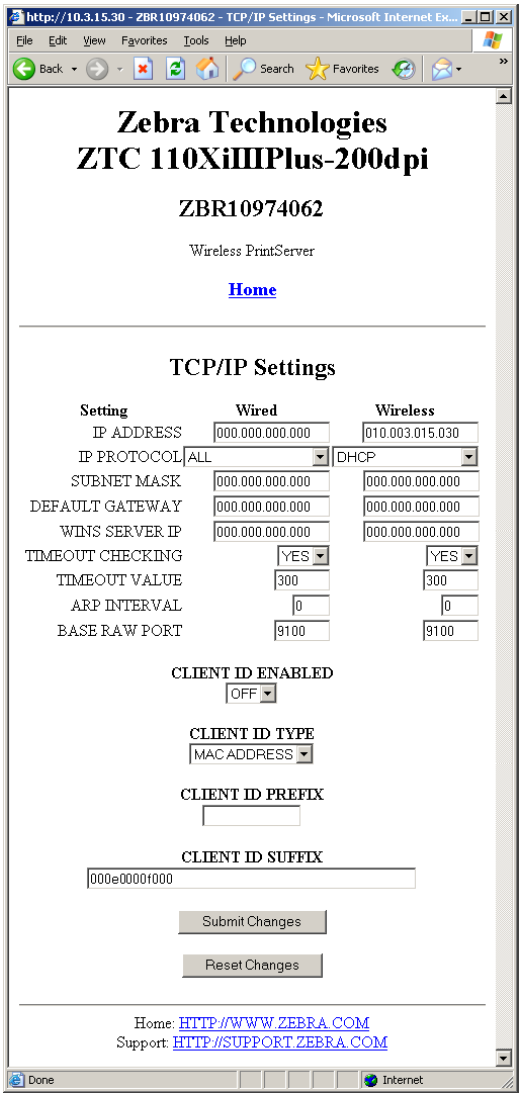
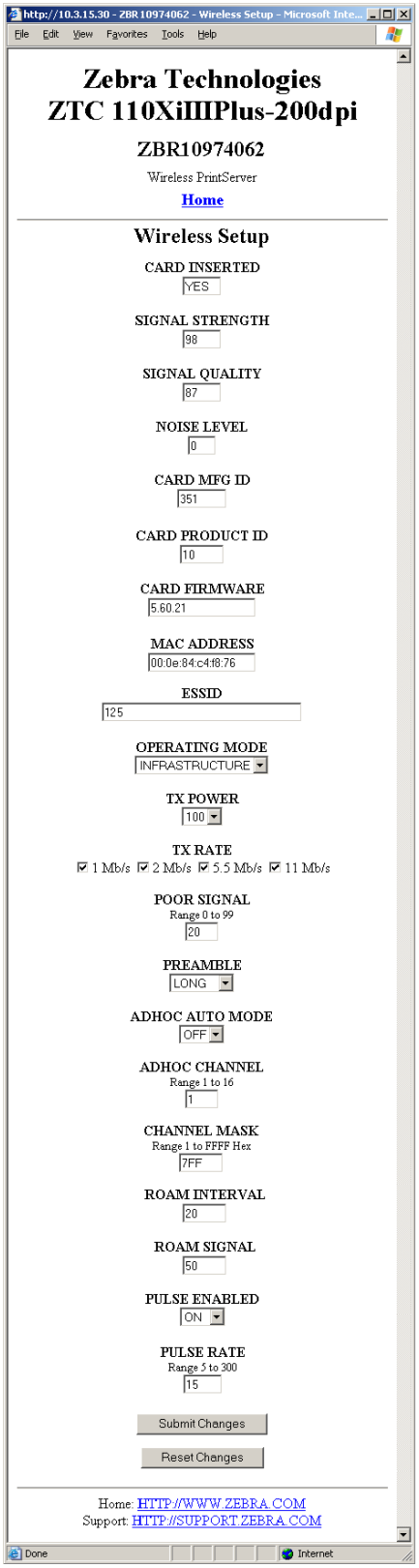
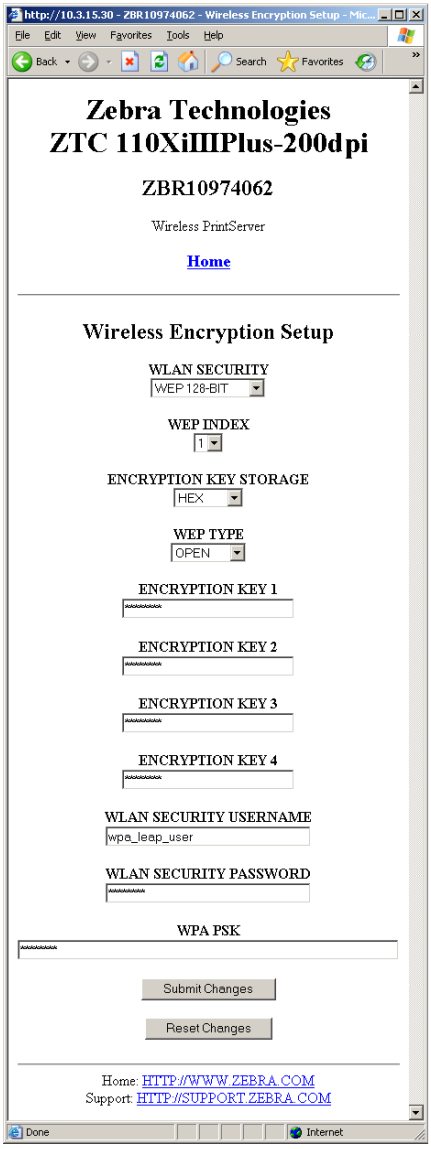


Table 21 • Subscreens: Network Communications Setup (Continued)

Wireless Setup



Wireless Encryption Setup



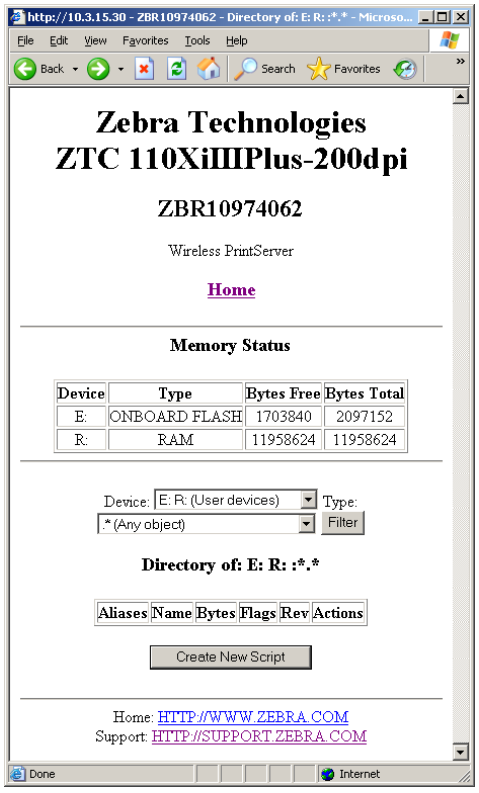
Directory Listing

The directory page lists all file system devices (A:, E:, R:, Z:). The size, name, and location for each stored object are displayed.

To create a new item on the Directory Listing screen, complete these steps:

1. On the printer home page, click **Directory Listing**.

   The Directory Listing screen displays.



2. From the Directory Listing screen, click **Create New Script**.

   The Create New Script screen displays.

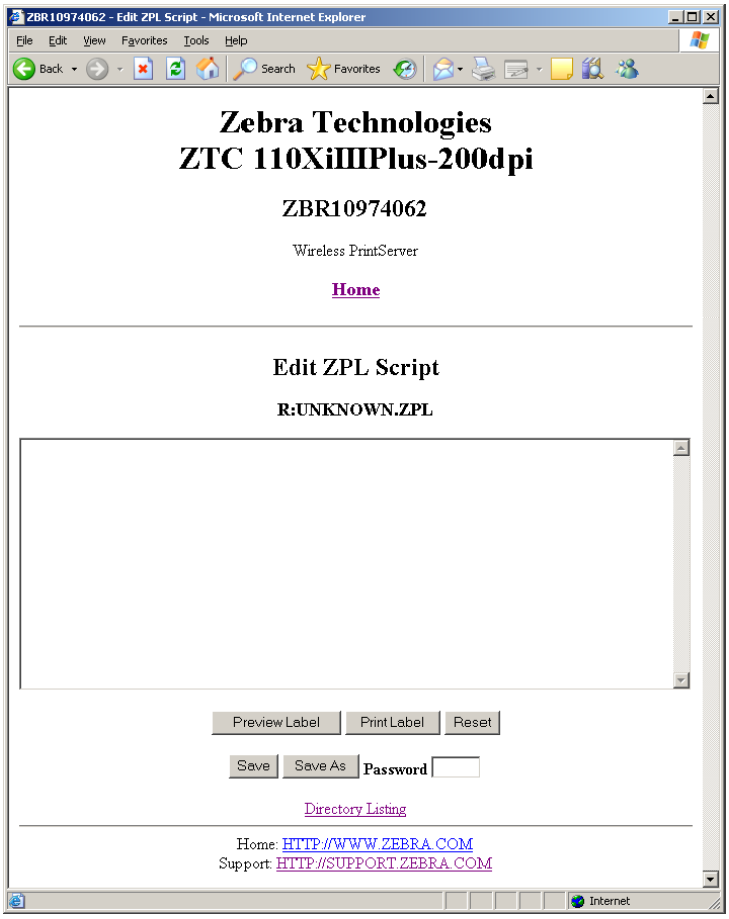
3. Select a device type from the drop-down menu to indicate a memory location that is appropriate to your needs.

   - **E: (ONBOARD FLASH)—**non-volatile memory, which is persistent across a power cycle.
   - **R: (RAM)—**volatile memory, which is not persistent across a power cycle.

4. Type a name for the file in the Name field.

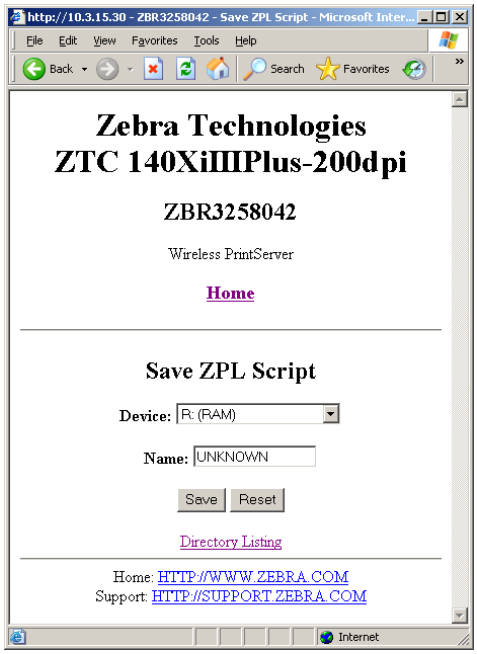
5. Click **Edit**.

   The Edit ZPL Script screen displays.



6. Enter the ZPL code in the text field.

7. Click one of the available buttons:

Button	Function/Operation
Preview Label	Displays a graphic representation of the label that results from the ZPL code.
Print Label	Sends the ZPL code to the printer.
Reset	Clears the text field.
Save	**a.** Enter the printer password in the password field. **b.** Click **Save**. If the correct password was entered, saves the label to the ZPL file name entered on the Create New Script screen.
Save As	**a.** Enter the printer password in the password field. **b.** Click **Save As**. The Save ZPL Script screen displays.  **c.** Enter a file name in the Name field. **d.** Click **Save**. If the correct password was entered on the Edit ZPL Script screen, the file is saved.

Alert Setup

For the printer to interact with ZebraNet Alert, SNMP settings must be established in these areas:

- the printer, via the WebView interface
- the Alert Printer Management Utility for logging SNMP traps

The ZebraLink messaging system provides for more than SNMP notification. Alerts can be routed to various destinations:

- TCP
- UDP
- e-mail
- serial port
- parallel port destinations

To view Alert Setup, complete these steps:

1. From the printer home page, click **Alert Setup**.

   The Alert Messaging System screen displays.

Establishing E-Mail Alert Messaging

ZebraNet Alert allows printer errors to be sent directly to any valid e-mail address. You can set up multiple e-mail addresses for routing different error messages or split notifications between e-mail and other network management tools.

To begin receiving e-mail notification of errors, complete these steps:

1. From the Alert Messaging System screen, click **Add Alert Message**.

   The Add Alert Message screen displays.

2. From the drop-down menu, specify the condition to send over e-mail, such as `HEAD ELEMENT BAD` or `PAPER OUT`.
3. Select a destination from the drop-down menu.
4. Enter a valid e-mail address to which the messages will be sent. (The Port field can be ignored for e-mail setup.)
5. Enter the printer password.
6. Click **Add Alert Message**.
7. On the add alert message confirmation page, click **Home** to return to the printer's home page.

8. From the printer's home page, click **View and Modify Printer Settings**. (You may be prompted for the printer's password if it was not entered recently.)

   The View and Modify Printer Settings screen displays.

9. Click **Network Configuration**.

   The Network Configuration Menu displays.

10. Click **SMTP**.

    The SMTP Setup screen displays.

11. Specify your SMTP server address and Print Server domain.

12. Click **Submit Changes**.

    The screen displays the following:

    Changes were successfully saved (temporarily).

13. Click **View and Modify Printer Settings**.

    The View and Modify Printer Settings page for your printer returns (see Figure 7 on page 51).

14. Click **Save Current Configuration**.

    The screen displays the following:

    Current configuration saved.

Printer Controls

This page offers control over basic printer functions.

To view Printer Controls, complete these steps:

1. From the printer home page, click **Printer Controls**.

   The printer prompts you for a password.

2. Enter the password for your printer. The default password is **1234**.

3. Click **Submit Changes**.

   The screen displays the following:

   Access Granted. This IP Address now has admin access to the restricted printer pages. Please Click here to proceed

4. Click on the statement.

   This Printer Controls screen displays.

5. Click one of the available buttons:

Button	Function
Pause	Toggles the pause option on the printer.
Feed	Causes printer to feed one label.
Cancel One Format	Cancels the currently printing format.
Cancel All Formats	Cancels all formats.
Reset Printer	Causes the printer to perform its standard reset without cycling power. **a.** Click **Reset Printer**. The screen prompts **Are you sure you want to reset the printer?** **b.** Click **Reset**. The printer resets itself.

Print Server Settings

This section provides you with instructions for viewing the current print server settings.

To apply changes made in this section, use the default user ID and password:

- User ID: **admin**
- Password: **1234**

To view the print server menu, complete these steps:

1. From the printer home page, click **Print Server Settings**.

   The Print Server screen opens. The Network Configuration Menu displays. Table 22 shows the screens that appear when you click on the menu selections on this page.

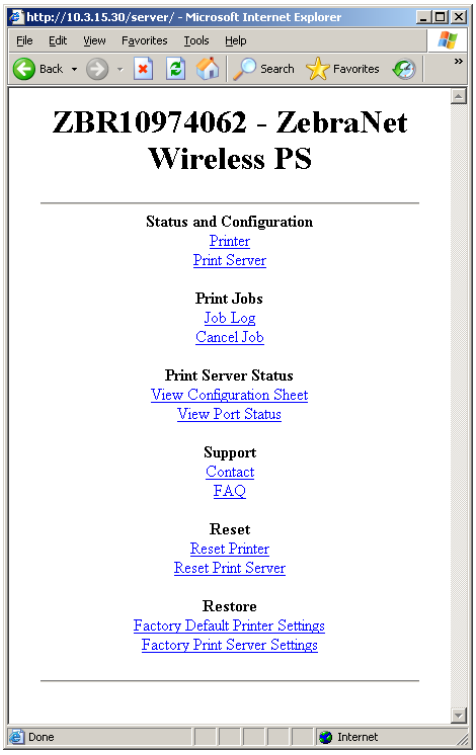


Table 22 • Subscreens: Print Server Settings

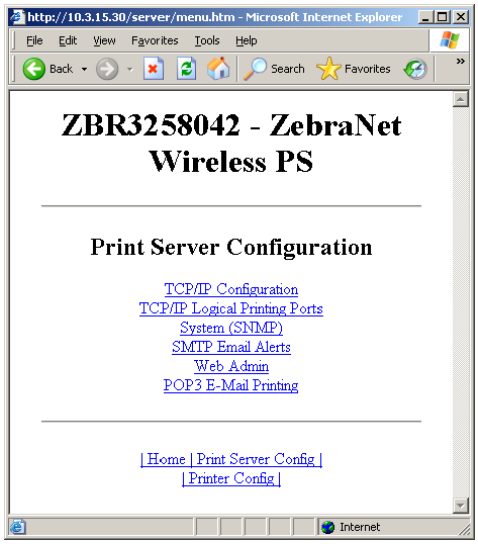
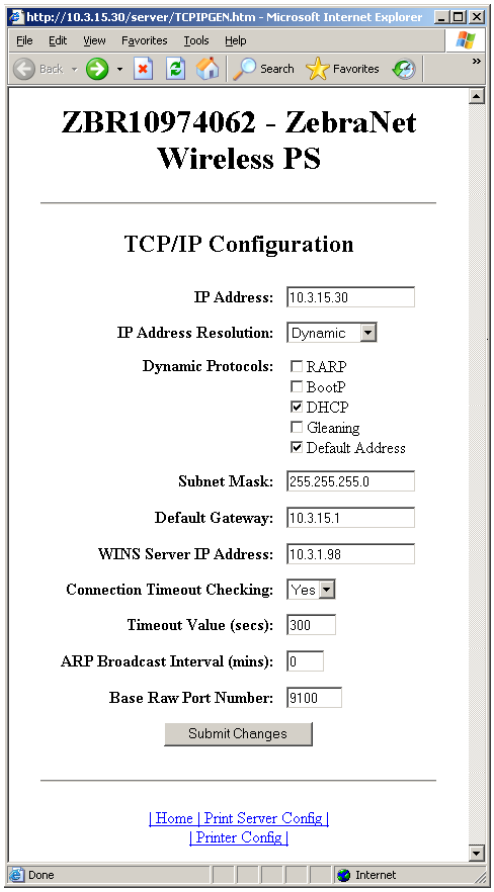
Printer Returns to printer home page.	
Print Server  	The Print Server Configuration screen allows you to configure the following print server categories. Click the links that follow to go to the screen descriptions. • TCP/IP Configuration • TCP/IP Logical Printing Ports • System (SNMP) • SMTP Email Alerts • Web Admin • POP3 E-Mail Printing

Table 22 • Subscreens: Print Server Settings (Continued)

Print Server:
TCP/IP Configuration



Print Server:
TCP/IP Logical Printing Ports

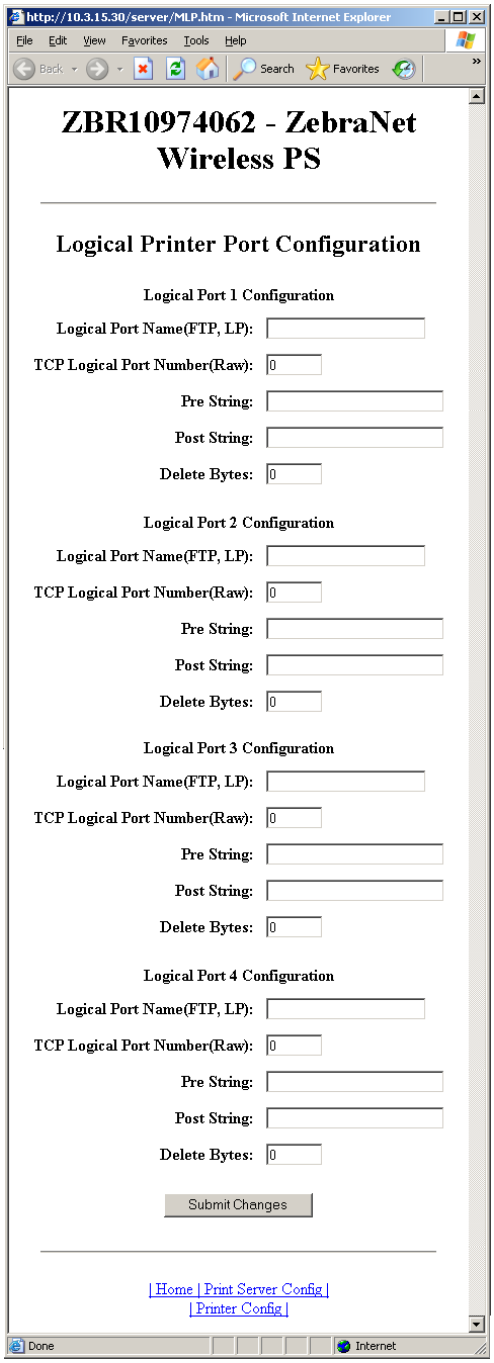
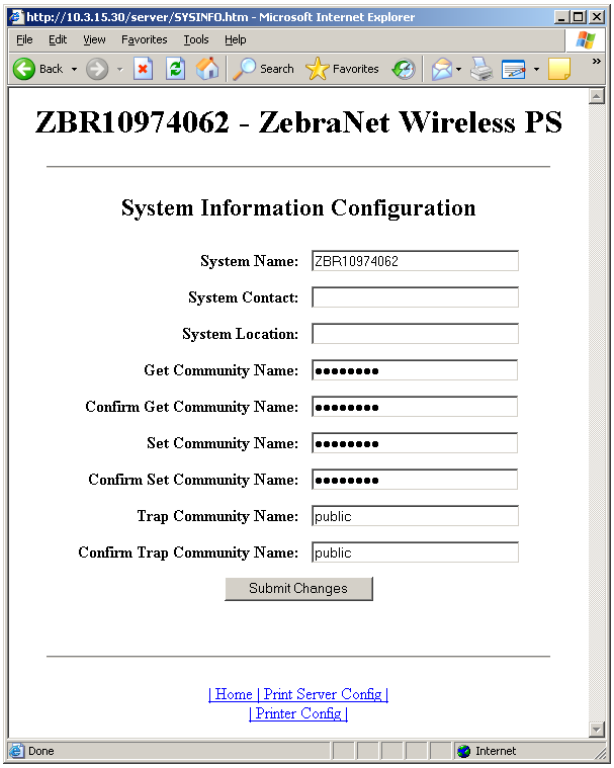


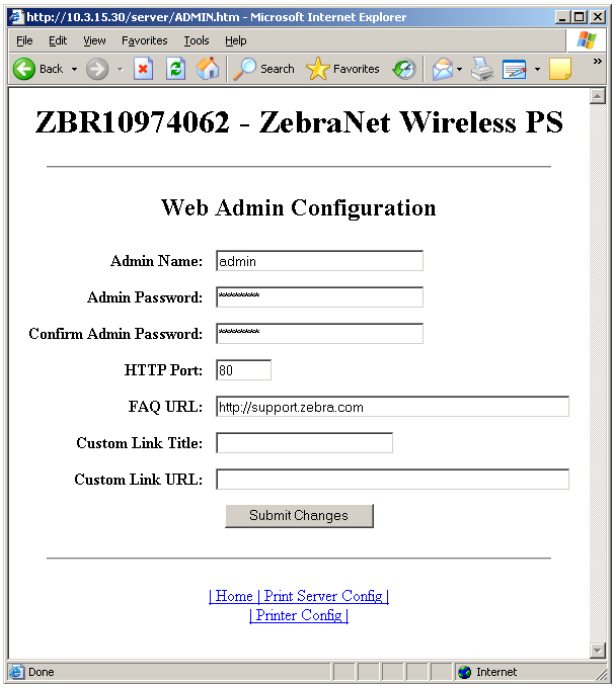
Table 22 • Subscreens: Print Server Settings (Continued)

Print Server:
System (SNMP)



Print Server:
SMTP Email Alerts

Print Server:
Web Admin



Print Server:
POP3 E-Mail Printing

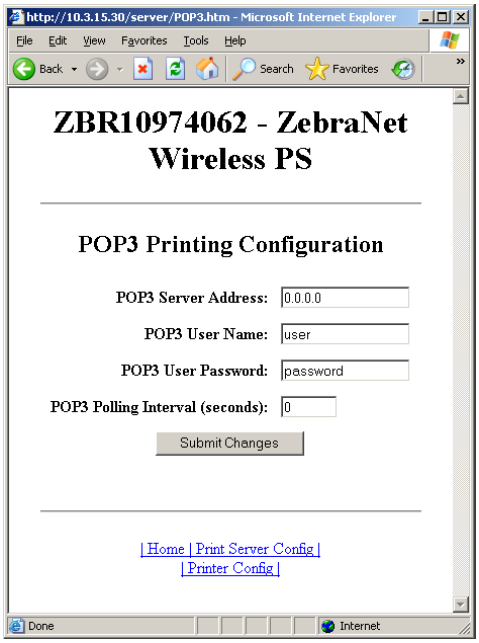
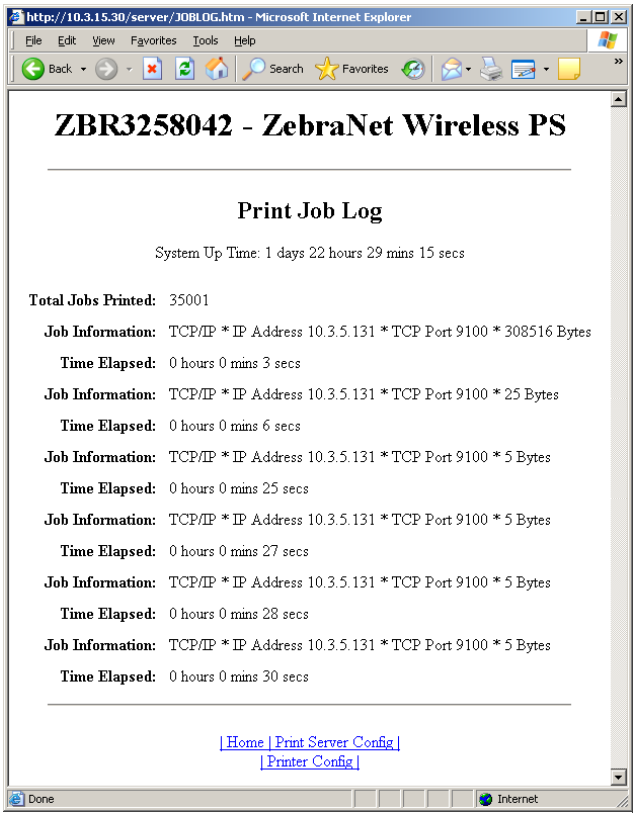


Table 22 • Subscreens: Print Server Settings (Continued)

Job Log



Cancel Job

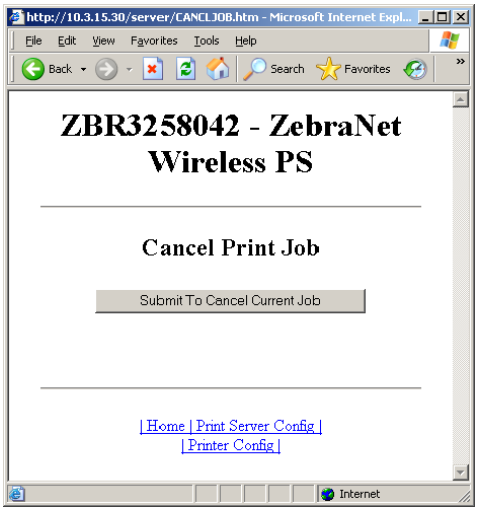
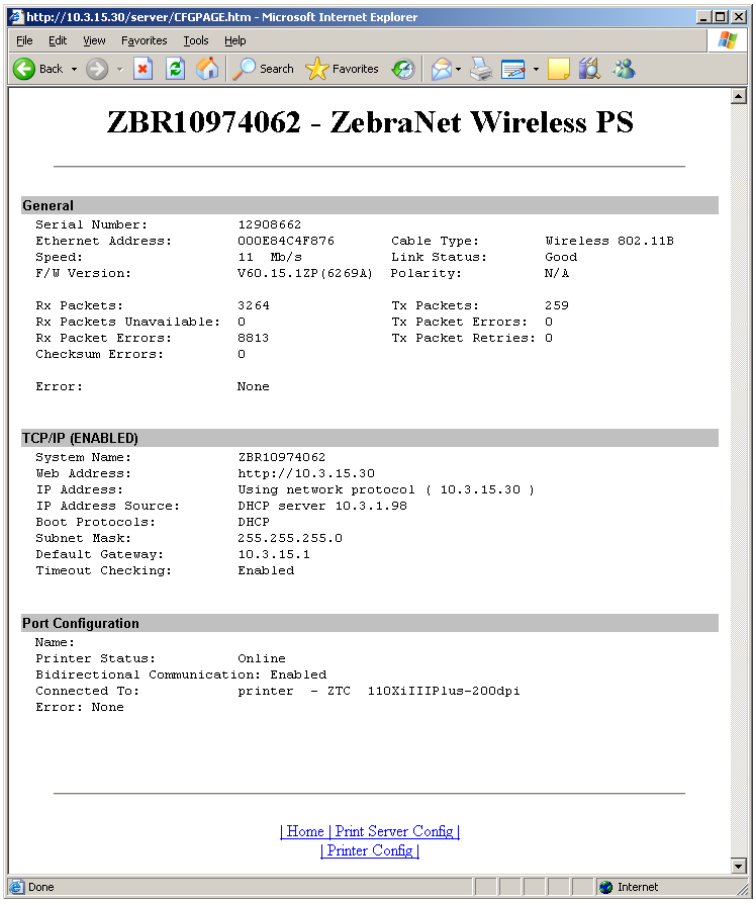
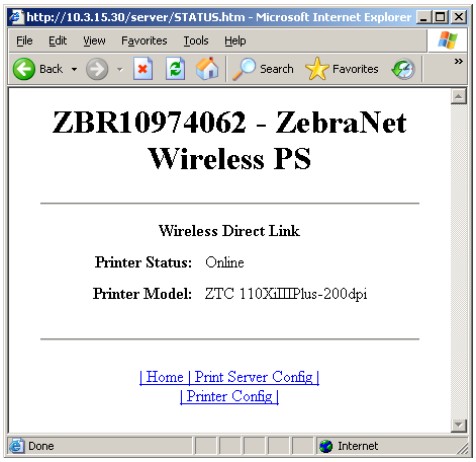


Table 22 • Subscreens: Print Server Settings (Continued)

View Configuration Sheet



View Port Status



Contact

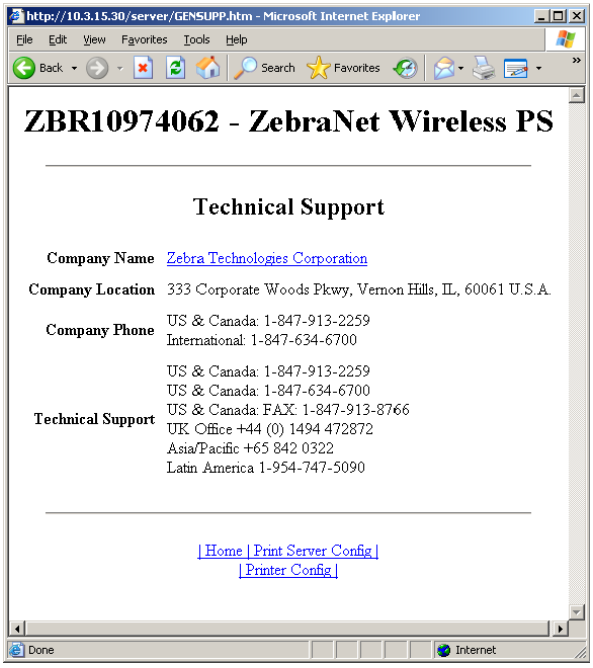
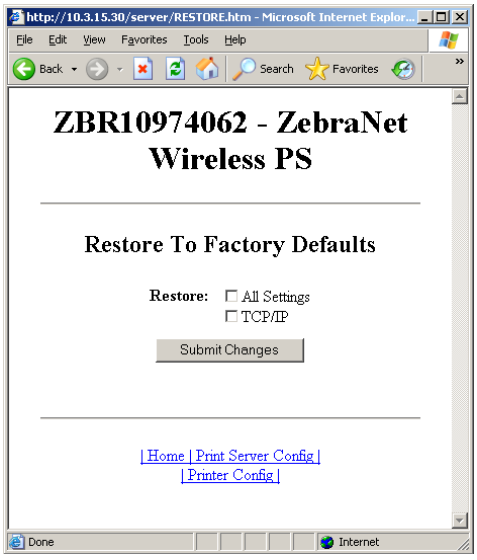


Table 22 • Subscreens: Print Server Settings (Continued)

FAQ Goes to http://support.zebra.com.	**Reset Printer** Goes to the Printer Controls page. See *Printer Controls* on page 68.
Reset Print Server 	**(Restore) Factory Default Printer Settings** Returns to the View and Modify Printer Settings page. See *View and Modify Printer Settings* on page 51.
(Restore) Factory Print Server Settings 	

Glossary

Extensible Authentication Protocol over Flexible Authentication via Secure Tunneling (EAP-FAST) Extensible Authentication Protocol-Flexible Authentication via Secure Tunneling (EAP-FAST) is a publicly accessible IEEE 802.1X EAP type developed by Cisco Systems. It is available as an IETF informational draft. Extensible Authentication Protocol-Flexible Authentication via Secure Tunneling (EAP-FAST) is a publicly accessible IEEE 802.1X EAP type developed by Cisco Systems. It is available as an IETF informational draft. Cisco developed EAP-FAST to support customers who cannot enforce a strong password policy and wish to deploy an 802.1X EAP type that does not require digital certificates, supports a variety of user and password database types, supports password expiration and change, and is flexible, easy to deploy, and easy to manage. For example, a customer using Cisco LEAP who cannot enforce a strong password policy and does not want to use certificates can migrate to EAP-FAST for protection from dictionary attacks.

Extensible Authentication Protocol over Transport Layer Security (EAP-TLS) Second generation Wi-Fi security. Current Wi-Fi security standards (802.1x) define the use of the TLS protocol encapsulated within the Extensible Authentication Protocol (EAP) as one of the strongest security mechanisms for Wi-Fi. Using EAP-TLS provides well-regarded, standards-based security between an access point and a Wi-Fi client. This is a Microsoft standard.

- A form of 802.1X (EAP) authentication
- Uses client and server certificates for mutual authentication (PKI)
- TLS 1.0 (Transport Layer Security) is based on Secure Socket Layer (SSL) 3.0

Extensible Authentication Protocol over Tunneled Transport Layer Security (EAP-TTLS) EAP-TTLS is an extension of EAP-TLS which provides for certificate-based, mutual authentication of the client and network. Unlike EAP-TLS, however, EAP-TTLS requires only server-side certificates, eliminating the need to configure certificates for each WLAN client. In addition, it supports legacy password protocols, so you can deploy it against your existing authentication system (such as tokens or Active Directories.) It securely tunnels client authentication within TLS records, ensuring that the user remains anonymous to eavesdroppers on the wireless link and the entire network to the RADIUS server.

firmware This is the term used to specify the printer's operating program. This program is downloaded to the printer from a host computer and stored in FLASH memory. Each time the printer power is turned on, this operating program starts. This program controls when to feed the media forward or backward and when to print a dot on the label stock.

FLASH memory FLASH memory is non-volatile and maintains the stored information intact when power is off. This memory area is used to store the printer's operating program. In addition, this memory can be used to store optional printer fonts, graphic formats, and complete label formats.

Kerberos Network authentication protocol that uses the concept of a time-limited "ticket" for access to network resources. Kerberos uses key distribution and client/server authentication.

Lightweight Extensible Authentication Protocol (LEAP or Lightweight EAP) A non-standard Wireless Security protocol from Cisco. LEAP uses mutual authentication, meaning that both the user and the access point must be authenticated before access to the LAN is allowed. Mutual authentication can help protect wireless networks from rogue access points, man-in-the-middle attacks, sniffing attacks, and active attacks. Based on 802.1X EAP protocol.

liquid crystal display (LCD) The LCD is a back-lit display that provides the user with either operating status during normal operation or option menus when configuring the printer to a specific application.

Protected Extensible Authentication Protocol (PEAP) A draft standard for a common approach to wireless-network user authentication.

- A form of 802.1X authentication
- Currently an IETF draft (still subject to change)
- Performs mutual client/server authentication using transport layer security (TLS), but only requires a server certificate
- With no client certificate, configuration is easier than EAP-TLS

Wi-Fi Protected Access (WPA) WPA is a security protocol for wireless local area networks (WLANs) that includes encryption and user authentication.

Wireless Encryption Protocol (WEP) WEP is a security protocol for wireless local area networks (WLANs) that secures data transmissions using 64-bit or 128-bit encryption.

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