User's Manual

EasyCoder™ 7421 Printer

Intermec

A **UNOVA** Company

Manual Change Record

Date	Revision	Record of Changes
3/00	003	Information about the *Printer Companion CD,* PrintSet, and network interface cards was added.

Contents

1

Operating the Printer

2

Configuring the Printer

3 ## Maintaining the Printer

4 ## Troubleshooting

A ## Printer Specifications

Before You Begin

This section introduces you to standard warranty provisions, safety precautions, warnings and cautions, terms, and sources of additional product information. A documentation roadmap is also provided to help you find information.

Warranty Information

To receive a copy of the standard warranty provision for this product, contact your local Intermec sales organization. In the U.S. call 1.800.755.5505, and in Canada call 1.800.688.7043. Otherwise, refer to the Worldwide Sales & Service list that was shipped with this manual for the address and telephone number of your Intermec sales organization.

Safety Summary

Your safety is extremely important. Read and follow all warnings and cautions in this book before handling and operating Intermec equipment. You can be seriously injured, and equipment and data can be damaged if you do not follow the safety warnings and cautions.

Do not repair or adjust alone   Do not repair or adjust energized equipment alone under any circumstances. Someone capable of providing first aid must always be present for your safety.

First aid   Always obtain first aid or medical attention immediately after an injury. Never neglect an injury, no matter how slight it seems.

Resuscitation   Begin resuscitation immediately if someone is injured and stops breathing. Any delay could result in death. To work on or near high voltage, you should be familiar with approved industrial first aid methods.

Energized equipment   Never work on energized equipment unless authorized by a responsible authority. Energized electrical equipment is dangerous. Electrical shock from energized equipment can cause death. If you must perform authorized emergency work on energized equipment, be sure that you comply strictly with approved safety regulations.

Warnings, Cautions, and Notes

The warnings, cautions, and notes in this manual use these formats.

Warning
A warning warns you of an operating procedure, practice, condition, or statement that must be strictly observed to avoid death or serious injury to the persons working on the equipment.

Avertissement
Un avertissement vous alerte d'une procédure de fonctionnement, d'une méthode, d'un état ou d'un rapport qui doit être strictement respecté pour éviter l'occurrence de mort ou de blessures graves aux personnes manupulant l'équipement.

Caution
A caution alerts you to an operating procedure, practice, condition, or statement that must be strictly observed to prevent equipment damage or destruction, or corruption, or loss of data.

Conseil
Une précaution vous avertit d'une procédure de fonctionnement, d'une méthode, d'un état ou d'un rapport qui doit être strictement respecté pour empêcher l'endommagement ou la destruction de l'équipement, ou l'altération ou la perte de données.

Notes: Notes are statements that either provide extra information about a topic or contain special instructions for handling a particular condition or set of circumstances.

About This Manual

This manual contains all of the information necessary to operate, configure, maintain, and troubleshoot the 7421 bar code label printer. This manual was written for all users who need to know how to use the printer to print labels.

What You Will Find in This Manual

This table summarizes the information in each chapter of this manual:

For Information On	Refer To
Operating the printer	Chapter 1, "Operating the Printer." Explains the printer front panel, tells you how to load media for self-strip, load fanfold media, and insert the optional memory card.
Configuring the printer	Chapter 2, "Configuring the Printer." Explains how to configure the printer for optimal performance. You will learn how to set the media sensitivity number, the print darkness, adjust the label sensors, and print a test label.
Routine maintenance	Chapter 3, "Maintaining the Printer." Shows how to maintain the printer.
Troubleshooting	Chapter 4, "Troubleshooting." Instructs how to clear error messages and troubleshoot programming or configuration problems.
Printer specifications and options	Appendix A, "Printer Specifications." Lists the specifications for the printer, the available options, and the supported symbologies.
Communications, printer protocols, and printer interfaces	Appendix B, "Communications Reference." Defines the communications protocol and the interfaces that the printer uses to communicate.
Character sets	Appendix C, "Character Sets." Contains tables for the character sets that your printer supports.

Terms

Listed below are special terms used throughout the manual.

"Printer" refers to the 7421 bar code label printer.

"Media" is the general term used to describe the label stock (roll, fanfold, or tag) on which the printer prints labels.

"Label" refers to the individual labels of your media.

"Host" refers to a personal computer or other computer that communicates with the printer.

A "symbol" or "bar code symbol" consists of alphanumeric characters encoded in a bar code format.

Other Intermec Materials and Manuals

The following materials and manuals provide additional information about printing labels with your bar code printer.

Title	Intermec Part Number
EasyCoder 7421 Printer Setup Guide	066387
IPL Programming Reference Manual	066396
9161B Installation Manual	049572
9180 Network Controller User's Manual	054292
Data Communications Reference Manual	044737
RF System User's Manual	053574
The Bar Code Book	051241
Ethernet Adapter Installation Guide	068748
Ethernet Adapter User's Manual	068749
Printer Companion CD	1-020036

1

Operating the Printer

This chapter introduces the 7421 printer and explains features and options that are not covered in the EasyCoder 7421 Printer Setup Guide.

Getting to Know Your Printer

Features of your printer include:

* Support for either direct thermal or thermal transfer printing applications.

* High resolution 203 dots per inch (dpi) printhead.

* Ability to store downloaded formats, fonts, or graphics in removable memory cartridges.

* An easy to use software application called PrintSet™ (available on the *Printer Companion CD*). PrintSet makes configuring your printer and printing a test label effortless. See the PrintSet online help for more information on how to use the application.

Use the following illustrations to familiarize yourself with your printer.

Front View

Feed/Pause button
Media window
Media cover
Label taken sensor
Power light
Memory card slot cover
Cover release
7421U.001

Back View

Serial communications port

Parallel communications port

On/Off switch

Power cord connector
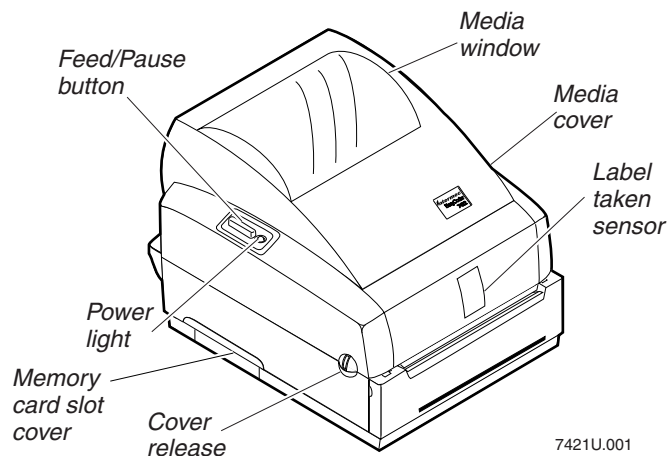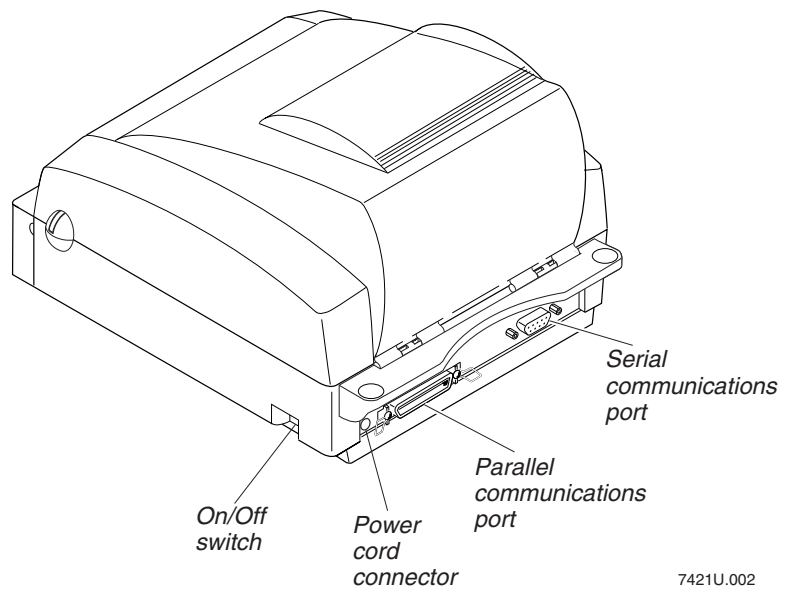
7421U.002

Several options are available for use with your printer. See Appendix A for complete descriptions of these options.

Note: To connect your 7421 printer to an Ethernet network, contact your local Intermec representative for information about the external Intermec Ethernet adapter that connects to the printer's parallel port.

Learning How to Operate the Printer

To operate the printer, you need to understand:

Power light The Power light helps you determine when the printer is on or off, or if there is a problem with the printer.

Feed/Pause button The Feed/Pause button allows you to feed out media, pause the printer, and print a hardware configuration label.

Understanding the Power Light

Use the Power light to monitor the status of the printer:

Light	State	Indication
Green	Off	Power off
	On	Power on
	Flashing	Receiving data
Red	On	System fault
	Flashing	Over-temperature
Orange	On	Media fault
	Flashing	Paused

Over-Temperature If the printer overheats, the Power light flashes red and the printer stops. Do not try to troubleshoot or adjust the printer—just allow it enough time to cool down and it will resume operation on its own.

Media or System Faults If the Power light turns red or orange and remains on, your printer is experiencing a media or system fault. For help, see Chapter 4, "Troubleshooting."

Using the Feed/Pause Button

The Feed/Pause button, located on the left side of the printer, performs these functions depending on the printer mode:

Printer Mode	You Want To	What to Do
Idle	Feed out one label or a minimum specified amount of media.	Press and release the Feed/Pause button.
	Continuously feed media.	Press and hold the Feed/Pause button. When you release the button, the media stops feeding.
	Take the printer offline.	Press the Feed/Pause button twice. Press the button again to bring the printer online.
Printing	Pause the printer.	Press and release the Feed/Pause button. Press and release the button again to resume printing.
	Cancel the current print job.	Press and hold the Feed/Pause button until the printer stops printing.
Powered on for the first time	Print the hardware configuration label.	Press and hold the Feed/Pause button while you turn on the printer.
	Print the software configuration label	Press the Feed/Pause button after the hardware configuration label stops printing.
	Print the pitch label.	Press the Feed/Pause button after the software configuration label stops printing.

Loading Media Into the Printer

In addition to loading roll media in the printer, you can:

- Use the peel-off option.

- Load fanfold media.

You can load media with the printer power turned on or off. The following procedures for loading media assume that you have turned on the printer. Refer to the *EasyCoder 7421 Printer Setup Guide* for instructions on loading rolls of media.

Using the Peel-Off Option

Use the peel-off option in printing applications where you want to apply labels to a surface immediately. After printing a label, the printer presents the label with the backing removed.

Note: You should find a small label with a three-digit sensitivity number printed on it attached to your roll of media or a 15-digit number stamped on the side of the media roll. Save this information. You will need it to set the correct media sensitivity number. For help, see "Setting the Media Sensitivity Number" in Chapter 2.

Note: Intermec does not recommend using fanfold media with the peel-off option.

To load labels using the peel-off option

1. Open the top cover of the printer.
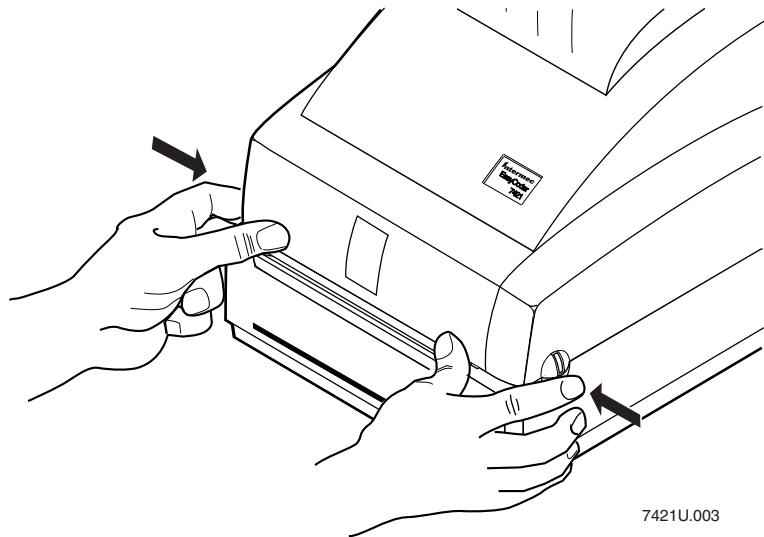
7421U.003

2. Open the printhead assembly by pulling the yellow release lever toward the front of the printer.
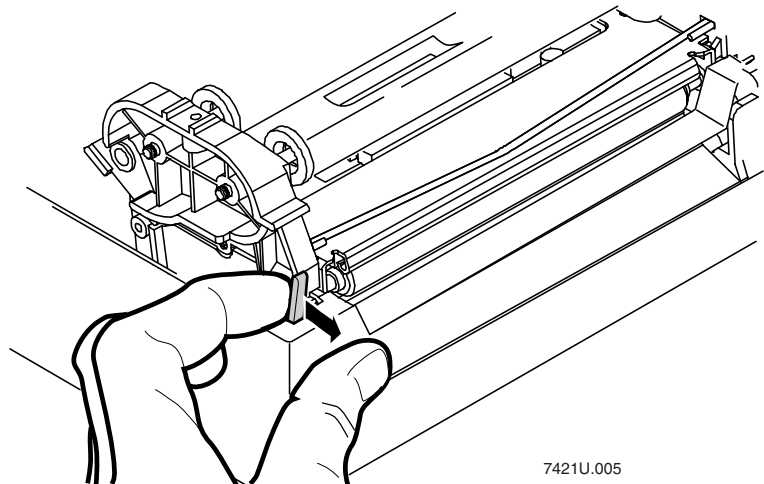
7421U.005

3. Lift the printhead up into the full open position.
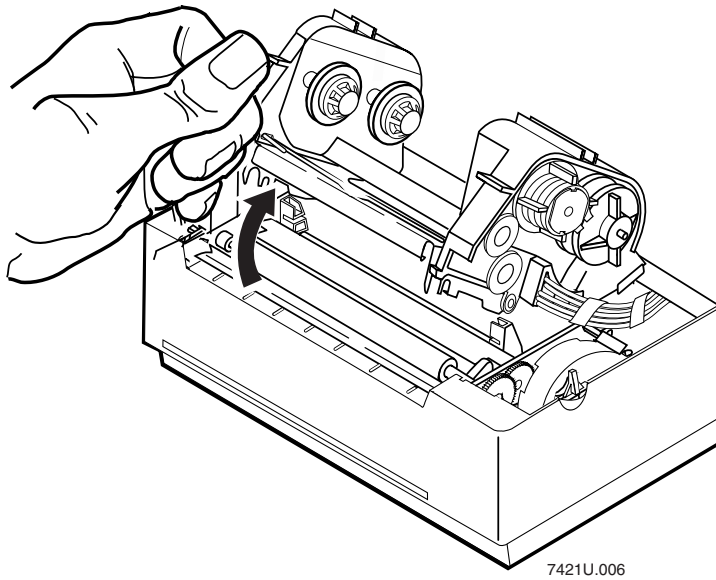
7421U.006

4. Adjust the guide tabs to their widest position by winding the yellow adjustment roller toward the front of the printer.

7421U.009
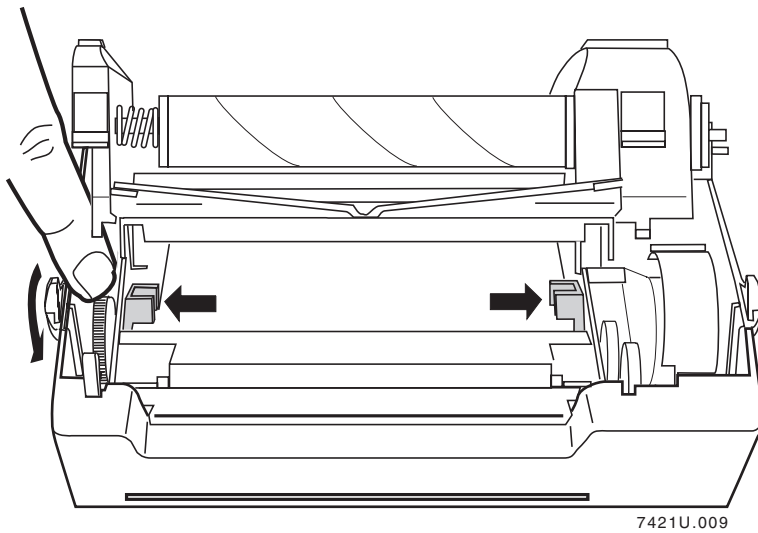
5. Insert the spindle into the roll of media.

4"
(102mm)

<3.9"
(99mm)

7421U.011
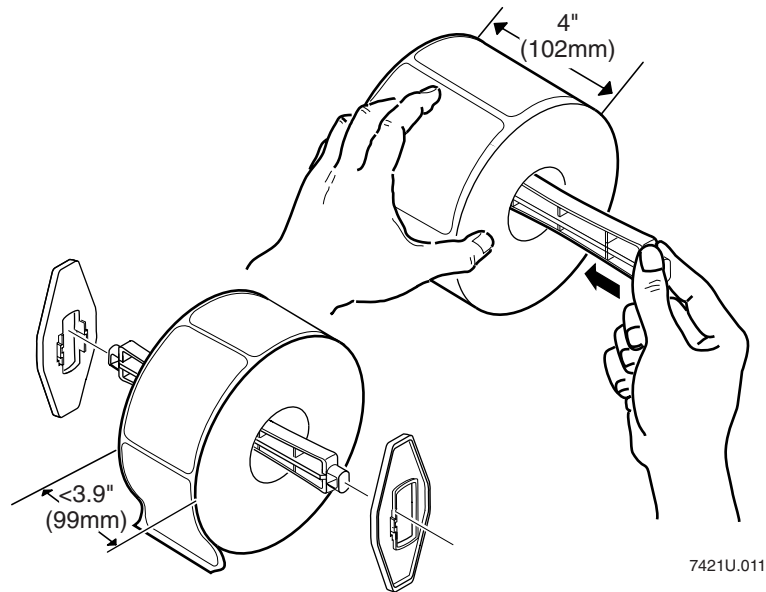
6. Place the roll inside the top cover so that the end feeds from the top.
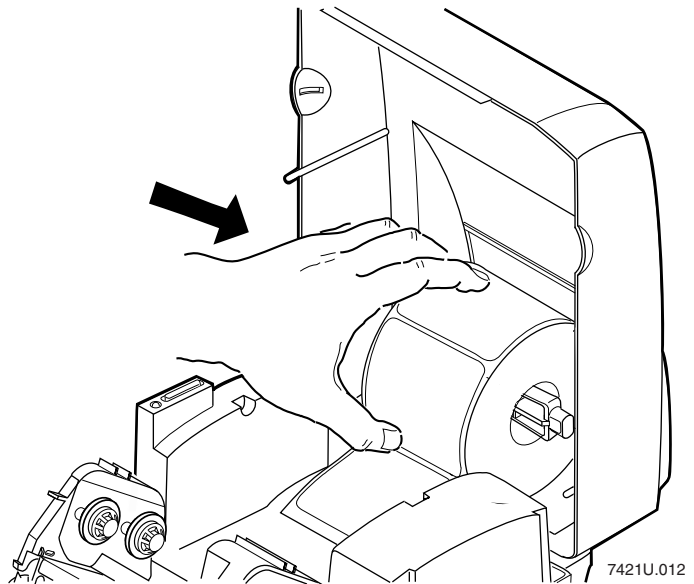
7421U.012

7. Insert the end of the roll into the printer and out the front of the printer.

   Note: *It is easier to insert the media through the printer mechanism if you cut the corners off the end of the first label.*
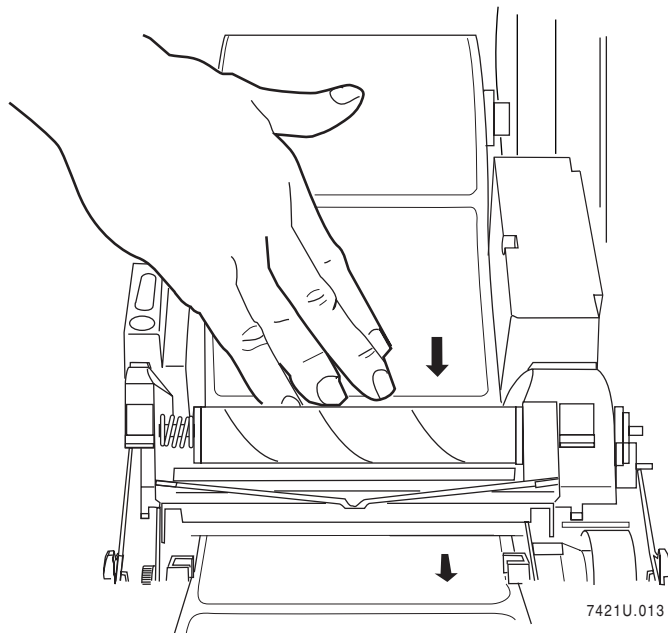
7421U.013

8. Rewind the excess paper onto the media roll while placing the spindle into the holder slots on the printer.

7421U.014
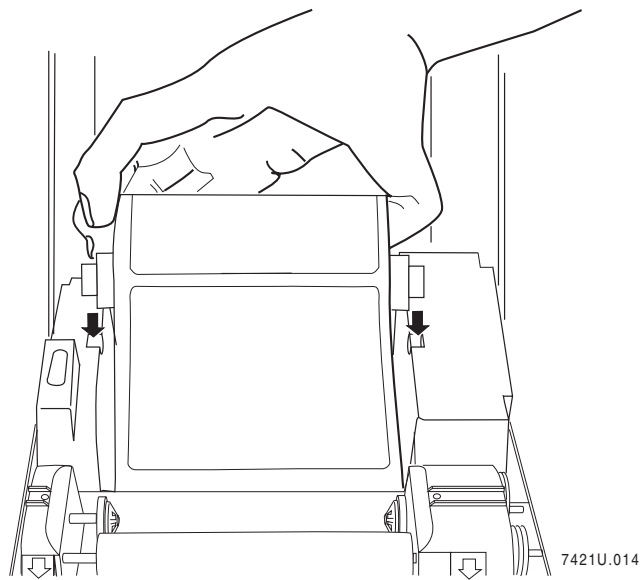
9. Center the labels in the printer path and adjust the label guides so that they just touch the edges of the label liner.

7421U.015
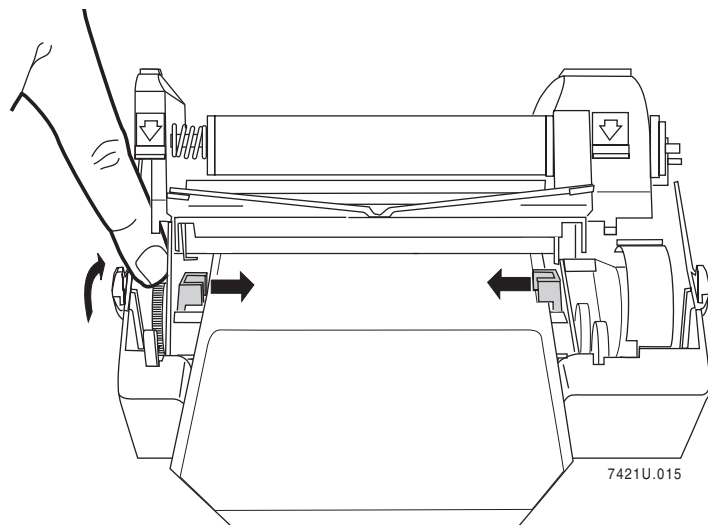
10. Pull the labels through the printer until at least two full labels (approximately 6 inches or 15 cm) are sticking out the front of the printer. Peel the first two labels from the label liner.

11. Insert the label liner between the front of the printer and the peel-off bar until the liner appears out the bottom slot.

Peel-off bar

7421U.016
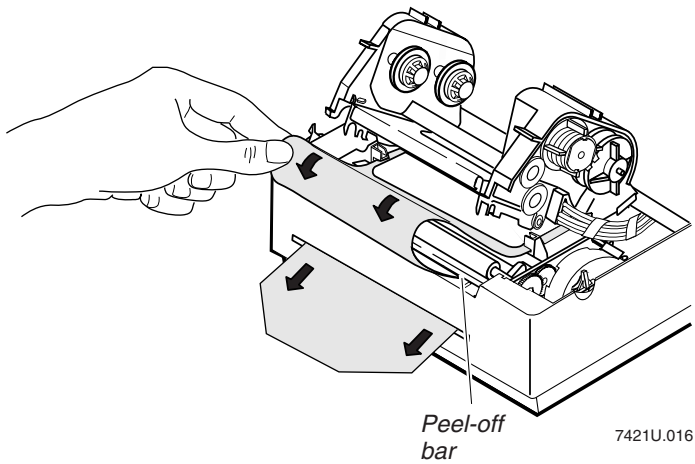
12. Pull the label liner out of the bottom slot until the liner is tight across the peel-off bar.
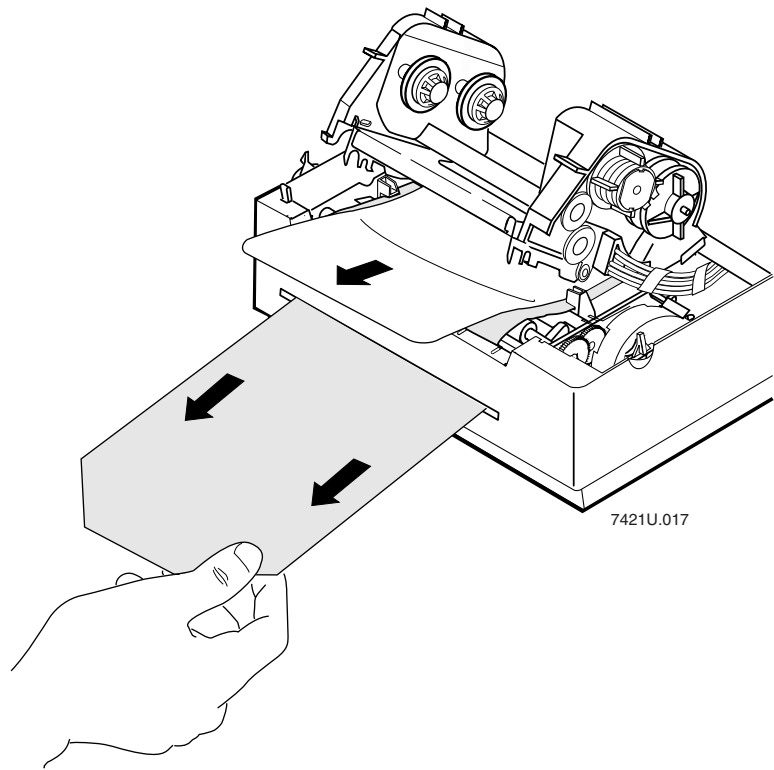
7421U.017

13. Lower the printhead assembly and lock it into the operating position by pressing down firmly on both sides of the printhead. Lower the printer cover.
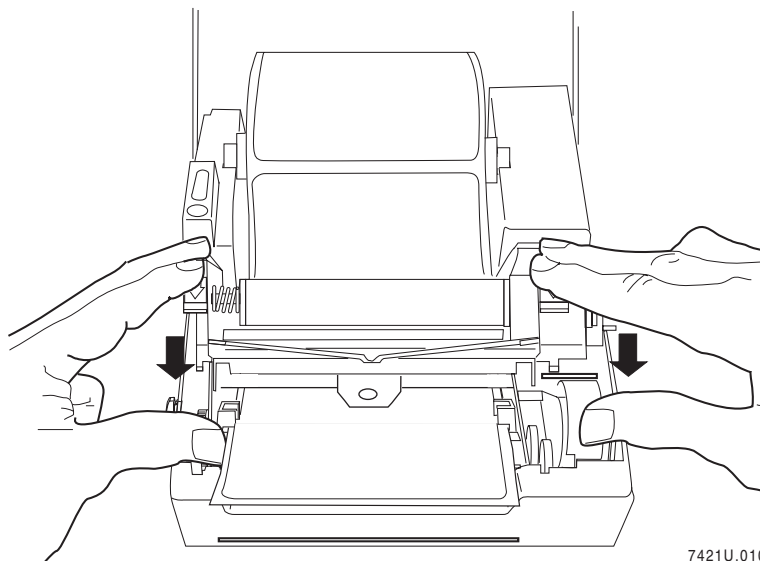
7421U.010

14. Activate the label taken sensor by pressing in on the top of the sensor. The printer is now ready for printing.

Label taken
sensor
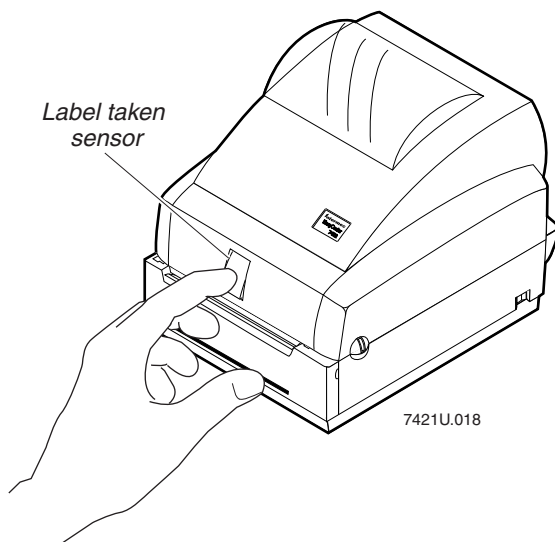
7421U.018

Loading Fanfold Media

In fanfold printing, you place a stack of fanfold media at the rear of the printer and feed it into the printer through a slot in the rear cover.

To load media for fanfold printing

1. Open the top cover and remove the spindle from the printer. Save the spindle for use with roll media.

2. Open the printhead assembly by pulling the yellow release lever (on the left side of the printer) toward the front of the printer.
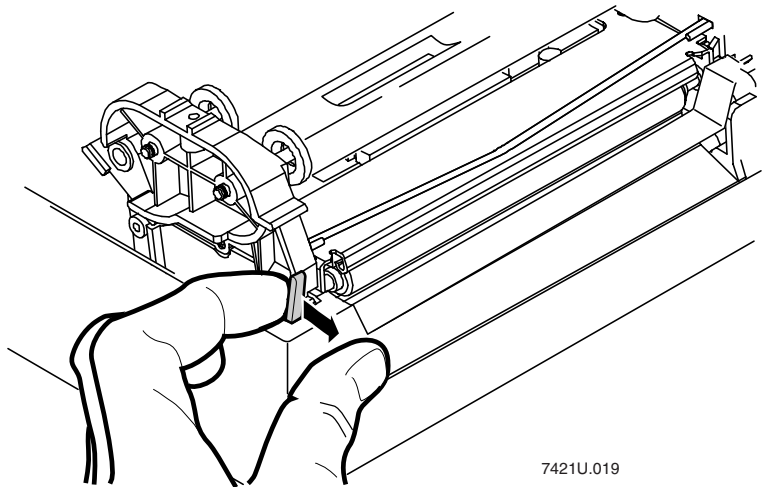
7421U.019

3. Lift the printhead up into the full open position.
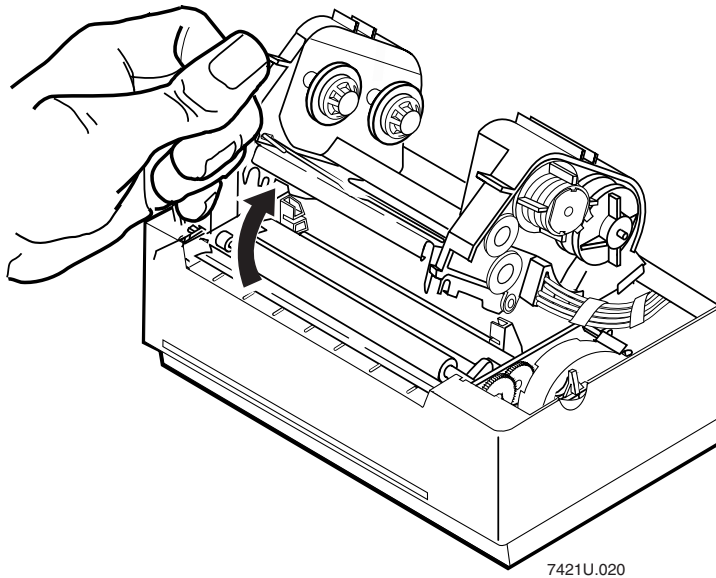
7421U.020

4. Adjust the guide tabs to their widest position by winding the yellow adjustment roller toward the front of the printer.

7421U.022
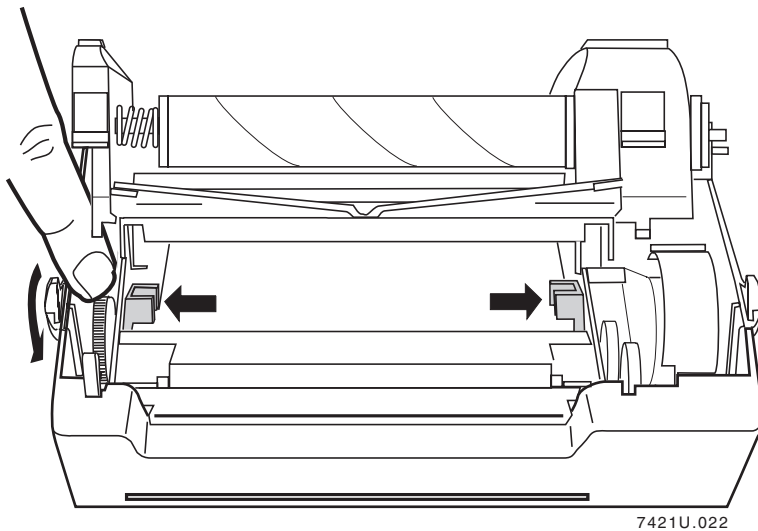
5. Place the fanfold media slightly lower than the slot in the printer back cover and insert the media through the slot, into the printer mechanism, and out the front of the printer.

Note: It is easier to insert the media through the printer mechanism if you cut the corners off the end of the first label of the media. Note how the corners of the media have been cut in the illustration below.
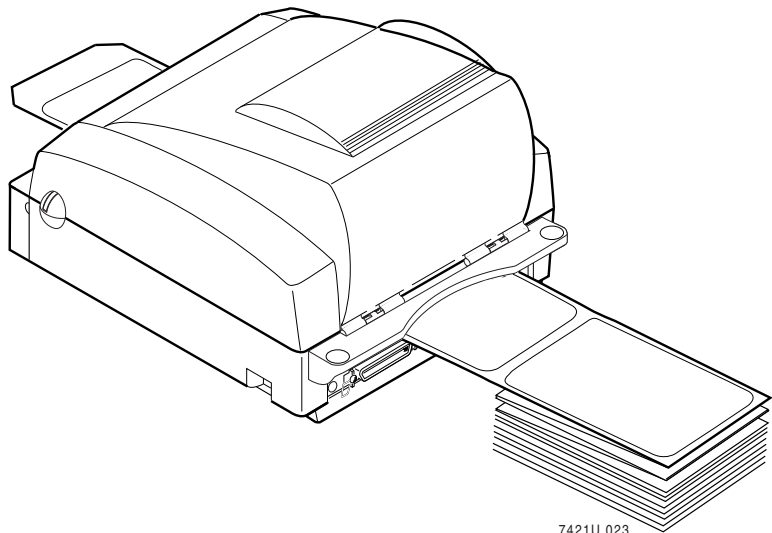
7421U.023

6. Center the labels in the printer path and adjust the label guides so that they just touch the edges of the label liner. Wind the yellow adjustment roller toward the rear of the printer.
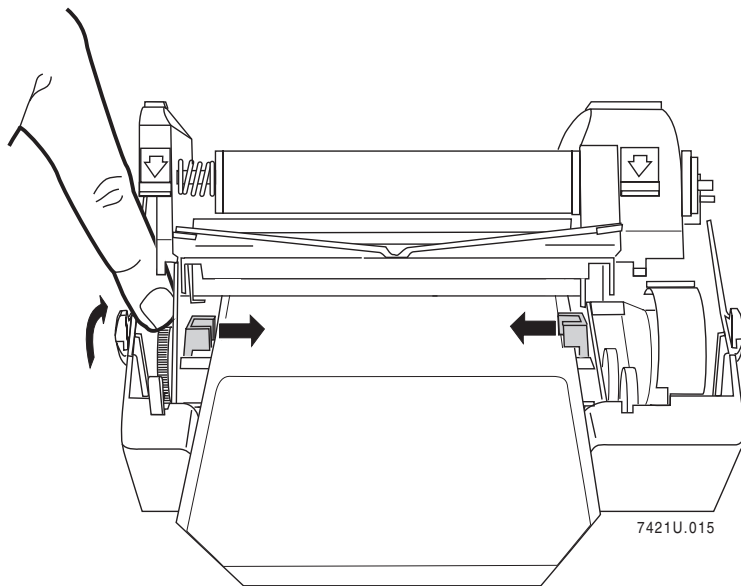
7421U.015

7. Lower the printhead assembly and lock it into the operating position by pressing down firmly on both sides of the printhead. Lower the printer cover.

Inserting the Optional Memory Card

Use the optional memory card to store label formats, fonts, and graphics in permanent memory. To order a memory card, contact your Intermec representative.

To insert the optional memory card

1. Turn the printer power off.

2. Remove the memory card slot cover.

7421U.028
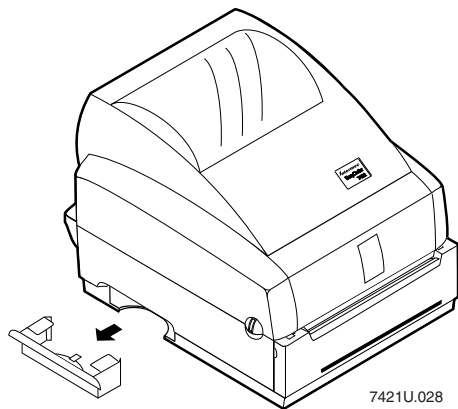
3. Insert the memory card, label side up, into the memory card slot. Push firmly to engage the memory card.

7421U.027

2
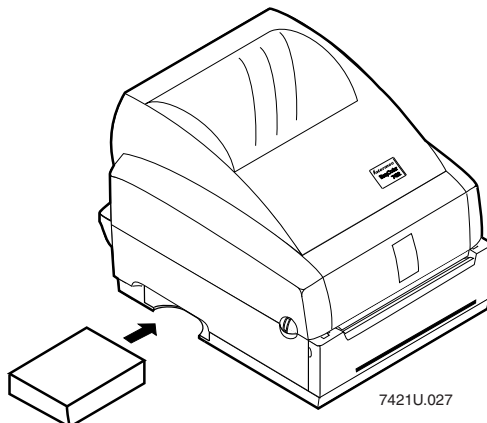
Configuring the Printer

Use this chapter to learn how to configure your 7421 printer, communicate with a PC, and print a test label with PrintSet.

Configuring the Printer

You are now ready to configure the printer by downloading data from the host to the printer. For your printer to operate most effectively, you need to configure:

- the media sensitivity number

- the print darkness

- the label gap sensors

Setting the Media Sensitivity Number

Media sensitivity is important because you use it to optimize print quality. The three digit media sensitivity number (MSN) specifies the amount of heat required by the printhead to image a label. The amount of heat that each roll of media or ribbon requires is unique due to different chemistries and manufacturing processes.

Intermec has developed heating schedules (the amount of heat required to image a label) to produce the highest possible print quality for Intermec media and ribbon combinations on Intermec printers. Look for the three digit media sensitivity number on:

- the side of the media roll. Use the last three digits (140 in the example) of the 15 digit number stamped on the roll for the media sensitivity number.

- a small label attached to the roll of media.

- a small label attached to the plastic bag of your ribbon roll. Your label may be different from this example, but it will contain the media sensitivity number.

Finding Your Media Sensitivity Number
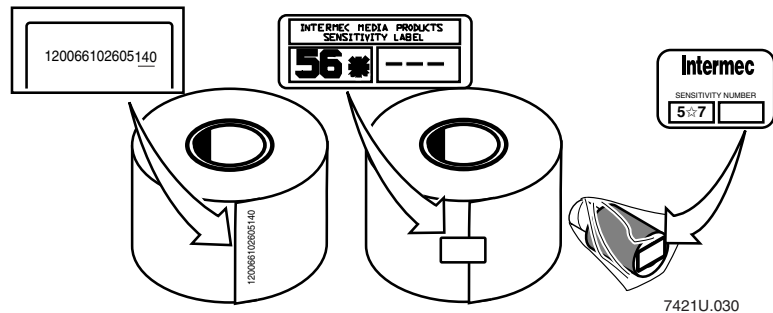
7421U.030

Note: Some ribbon rolls have the media sensitivity number printed on the inside core.

Use this three-digit number to optimize print quality and print speed on your printer. You can achieve the best print quality on the printer by using only Intermec ribbon and media products. The default sensitivity setting for thermal transfer media is 567. For direct thermal media, the default sensitivity setting is 180.

To change the media sensitivity number with PrintSet

1. Start the PrintSet application software.

2. Click the Paper type button.

3. In the Print Quality Setup dialog box, enter your three-digit number in the Media Sensitivity Number field.

4. Click OK.

5. Download your change to the printer by pressing the button to send command updates to the attached printer.

Setting the MSN for Intermec Media and Ribbon

For direct thermal media, use the three-digit media sensitivity number located on the roll of media to set the media sensitivity number. You can also use the values from the tables in the next section.

For thermal transfer media, you need to look in two places to determine the sensitivity number. The media sensitivity number on each roll of thermal transfer media or ribbon has an asterisk (*) in place of one of the digits. On thermal transfer media, the number contains the first and second digits, with an asterisk in place of the third digit. One the thermal transfer ribbon, the number contains the first and third digits, with an asterisk in place of the second digit.

To optimize the sensitivity number for thermal transfer media, you combine the digits like this:

Media or Ribbon	Sensitivity Number	Description
Thermal transfer media	56*	The asterisk reserves the third digit to identify the ribbon's sensitivity number.
Thermal transfer ribbon	5*7	The asterisk reserves the second digit to identify the media's sensitivity number.
	567	Optimal media sensitivity number

Setting the MSN for Other Media and Ribbon

If you are not using Intermec media and ribbon, or if you misplaced your packaging with the three digit-sensitivity number label on it, you can set an approximate sensitivity number. The first column of the Direct Thermal and Thermal Transfer Media Sensitivity Settings tables list the approximate sensitivity settings. To achieve acceptable print quality, enter the three-digit media sensitivity number (for example, 600).

If you are unsure of how to set the media sensitivity number, start with the highest setting, which provides the lowest energy (600 for thermal transfer and 400 for direct thermal), and work your way down until you achieve the best print quality.

Direct Thermal Media Sensitivity Settings

Approximate Sensitivity Settings	Sensitivity Setting	Direct Thermal Media
400 Medium	470	Duratherm Lightning-2
	460	European IR
	440	European Thermal
100 Low	180	Duratherm II-1
	170	European Tag
	160	Duratherm II Tag
	140	European Top

Thermal Transfer Media and Ribbon Sensitivity Settings

Approximate Sensitivity Settings	Sensitivity Setting	Thermal Transfer Media (Media/Ribbon Stock)
600 Medium	687	Duratran TTR Polyester/Premium-3
(Plastic)	683	Duratran TTR Polyester/Premium-2
	677	Duratran Syntran/Premium-3/6
	673	Duratran Syntran/Premium-2
	637	European Polyethelene/Prem.-3/6
	633	European Polyester/Premium-2
	627	Duratran Kimdura/Premium-3/6
	623	Duratran Kimdura/Premium-2
500 Medium	567	Duratran II-1/Premium-3/6
(Paper)	563	Duratran II-1/Premium-2
	557	Duratran 5 mil Tag/Premium-3/6
	553	Duratran II Tag-5 mil/Premium-2
	537	European Tag/Premium-3/6
	533	European Tag/Premium-2
	527	Duratran II Tag-7 mil/Prem.-3/6
	523	Duratran II Tag-7 mil/Premium-2
	517	European Coated/Premium-3/6
	513	European Coated/Premium-2
300 Low (Plastic)	366	Super Premium Polyester/Super Premium-1

Adjusting the Print Darkness

Use the print darkness adjust to fine-tune the darkness of print on your labels. The fine adjustments compensate for variations in the media ("lot to lot"), the printhead, or the printer. The darkness adjustment is similar to the dark adjust available on a copier. An increase in print darkness increases the energy to the printhead and results in darker print. A decrease in print darkness decreases the energy to the printhead and results in lighter print.

Set the darkness after you enter the media sensitivity number. You can adjust the print darkness from + 10 to -10.

To adjust the print darkness with PrintSet

1. Start the PrintSet application software.

2. Click the Paper type button.

3. In the Print Quality Setup dialog box, adjust the Print Darkness slider bar until the setting that you want appears underneath it.

4. Click OK.

5. Download your change to the printer by pressing the button to send command updates to the attached printer.

Adjusting the Label Gap Sensor

The label gap sensor detects the gap between labels while they are being printed. The gap sensor automatically calibrates itself when you first turn on power to the printer. This adjustment compensates for manufacturing differences in label stock that may make it difficult for the gap sensor to detect the gap between labels.

To adjust the label gap sensor

1. Turn the printer power off.

2. Turn the printer power on.

The printer Power light flashes yellow and the printer advances to the next label. When the label gap sensor adjustment is complete, the Power light stops flashing and turns green.

Communicating With the Printer

Downloading is the universal term used to describe the transfer of information from the host to any connected peripheral device, such as your printer. When you transfer data from your printer to the PC or host, you are performing a process called *uploading*.

You can use several methods to download information to your printer. Use these products to communicate with your printer:

PrintSet Application Software Use the PrintSet application software to easily configure your printer from your PC. You can upload the current configuration settings, modify them, and then download them to your printer. PrintSet also lets you:

- download graphics and fonts.

- print test labels using resident fonts, user-defined bitmap graphics, or resident bar code symbologies.

- allocate printer memory.

- download configuration files to multiple printers.

For help using PrintSet, refer to the online help portion of the application software. PrintSet can be installed from the *Printer Companion CD*, which was shipped with your printer, or it can be downloaded from our Web site at www.intermec.com.

Intermec Printer Language (IPL) Commands You can create labels by downloading formats (designs) and data with IPL commands. You can use the printer IPL commands to perform functions and activate features of the printer. See the *IPL Programming Reference Manual* for more information.

Third-Party Software You can use third-party software to set many of the printer parameters. You can use PrintSet or the IPL command set to configure the parameters that your software does not set.

Use your third-party software to create label formats and convert graphics into a user-defined character (UDC) format that the printer can interpret.

Printing a Test Label

If you would like to test your communications by downloading a label, follow the example below. Use the PrintSet application software to send a test label to the printer.

To print the test label

1. Start the PrintSet application software.

2. Click the Test Print button:

3. Select the Test Label option button.

4. Select either the Text or the Bar Code option button.

   If you select text, you can choose any font in the Select Printer Font list box.

   If you select bar code, you can choose any symbology in the Select Symbology list box.

5. Click the Print button. Your 7421 printer prints out a test label.

For example, if you choose to print a bar code with the Code 39 symbology, your printer prints out a label similar to this one:
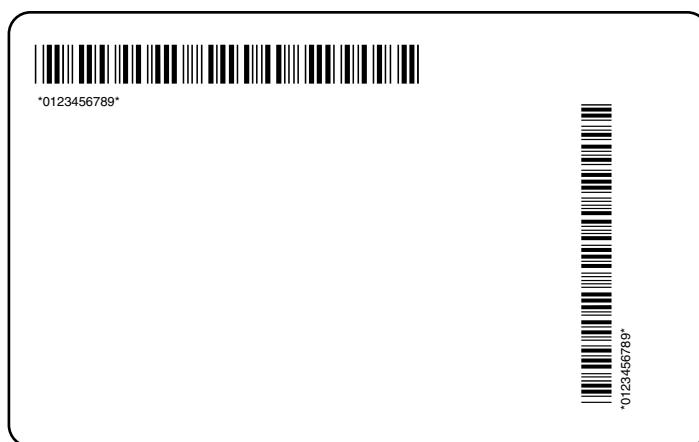
7421U.031

Using the Printhead Loading Modes

You can use two different printhead loading modes with the 7421 printer: Mirror Printing mode or Inverse Printing mode.

If you select Mirror Printing mode, the printer reverses the order of the data that is loaded into the printhead.

If you select Inverse Printing mode, the printer inverts all pixels in an image before it sends the data to the printhead. Only use Inverse Printing mode to print a small area of a label.

Note: Intermec does not recommend using Inverse Printing mode for printing multiple labels. The printhead is not covered under warranty if you use Inverse Printing mode for printing multiple labels.

To select Inverse or Mirror Printing mode

1. Start the PrintSet application software.

2. Click the Paper Handling button.

3. Select either the Enable Inverse Printing or the Enable Mirror Printing check box.
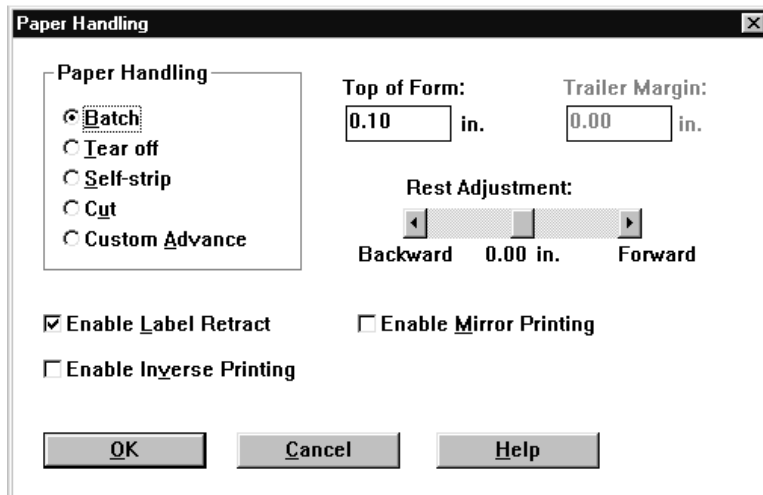
4. Click OK.

5. Download your change to the printer by pressing the button to send command updates to the attached printer.

3

Maintaining the Printer

This chapter contains cleaning procedures and a schedule detailing how often to perform maintenance procedures. You must clean the 7421 printer on a regular basis to keep it running at its highest performance level.

It is very important to perform the maintenance procedures if you expose the printer to dirt or debris.

Maintenance Schedule

Clean your printer regularly to maintain the print quality of your labels and extend the life of your printer. This table contains suggestions for cleaning the printer. Use the following illustration to locate the parts you need to clean.

Printer Component	Maintenance Period
Printhead	Inspect after every roll of media or ribbon. Clean after every roll (1,800 inches or 46 m) of media or more often if necessary.
Printer Cover	Clean as necessary.
Drive roller and peel-off bar Label gap sensor Label mark sensor Label taken sensor	Clean after every five rolls of media. If you are using hi-tack adhesive, you must clean these parts after every roll of media. If you are using tag stock or continuous media, you may want to clean the parts after every five rolls of media or as necessary. Clean these parts more often in environments that are harsh or dusty.

Label
taken
sensor

Printer cover

Printhead

Drive roller

Peel-off
bar

Label
mark sensor

Label
gap sensor

7421U.033
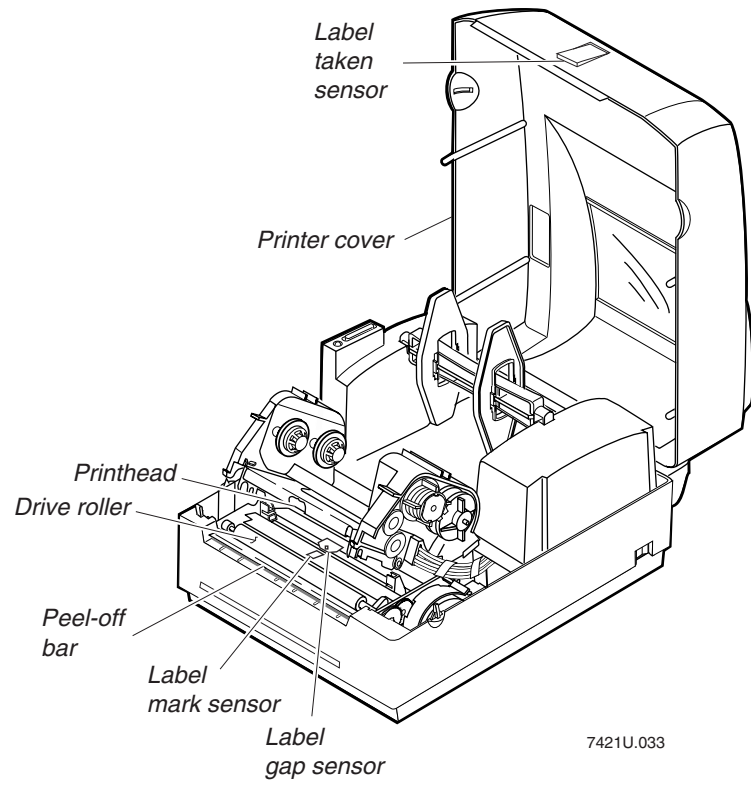
Tools for Cleaning the Printer

To clean the printer safely and effectively, use the following items:

- Isopropyl alcohol

- Cotton swabs

- Clean lint-free cloth

- Soapy water/mild detergent

The following procedures explain how to access the printer parts and clean them without causing any harm to the printer or yourself.

Warning
Switch off the printer power and remove the power cord before cleaning any part of the printer.

Avertissement
Mettez l'imprimante hors tension et débranchez le câble d'alimentation avant de nettoyer une parte de l'imprimante.

Cleaning the Printhead

In order for the printhead to provide good print quality, it must maintain close contact with the media. Therefore, cleaning media debris from the printhead is very important. Clean the printhead after every roll (1,800 inches or 46 m) of media or when necessary.

Caution
Do not use sharp objects such as knives or screwdrivers to scrape the printhead clean. Cleaning with sharp objects will damage the printhead. Clean with only a cotton swab, or a clean, lint-free cloth or tissue damp with isopropyl alcohol.

Conseil
N'utilisez pas d'objets pointus tels que couteaux ou tournevis pour nettoyer la tête d'imprimante. Nettoyer avec des objets pointus endommagera la tête d'imprimante. Nettoyez-la seulement avec de la ouate ou avec un linge propre et libre de peluches, humecté avec de l'alcool d'isopropyl.

To clean the printhead

1. Turn the printer power off and remove the power cord.

2. Open the printer cover.

3. Open the printhead assembly by pulling the yellow release lever (on the left side of the printer) toward the front of the printer. Lift the printhead up into the full open position.

4. Remove the media and ribbon (if necessary).

5. Use a cotton swab moistened with alcohol to remove any dirt, adhesive, or debris from the print surface on the bottom of the printhead.

Printhead

7421U.035
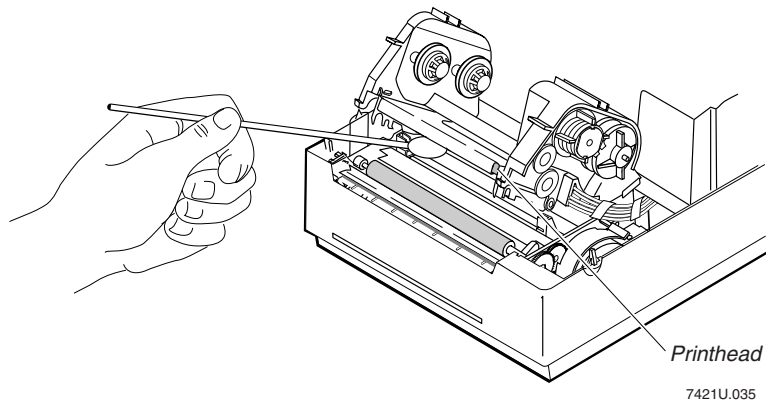
6. Wait 5 to 10 seconds for the print surface to dry. Replace the media and ribbon.

7. Lower the printhead assembly and lock it into the operating position by pressing down firmly on both sides of the printhead.

8. If you are finished cleaning, close the printer cover.

Cleaning the Printer Covers

Use a general purpose cleaner (soapy water/mild detergent) to clean the printer cover. Do not use abrasive cleansers or solvents and make sure that the cleaning solution does not get inside of the printer. Be sure to clean the transparent panel on the printer cover so that the media supply inside the printer is visible when you close the cover.

Cleaning the Drive Roller and Peel-Off Bar

Cleaning the drive roller and peel-off bar preserves print quality by maintaining close contact between the media and the printhead.

To clean the drive roller and peel-off bar

1. Turn the printer power off and remove the power cord.

2. Open the printer cover.

3. Open the printhead assembly by pulling the yellow release lever (on the left side of the printer) toward the front of the printer. Lift the printhead up into the full open position.

4. Remove the media and ribbon (if necessary).

5. Clean the drive roller by using a cloth dampened with isopropyl alcohol. Move the cloth over the drive roller in a side-to-side motion as shown.

6. Clean both sides of the peel-off bar with a cloth dampened with isopropyl alcohol. Remove all traces of dust, paper, and adhesive.

7. Replace the media and ribbon.

8. Lower the printhead assembly and lock it into the operating position by pressing down firmly on both sides of the printhead.

9. If you are finished cleaning, close the printer cover.

Cleaning the Drive Roller and Peel-Off Bar

Peel-off bar

Drive roller

7421U.037
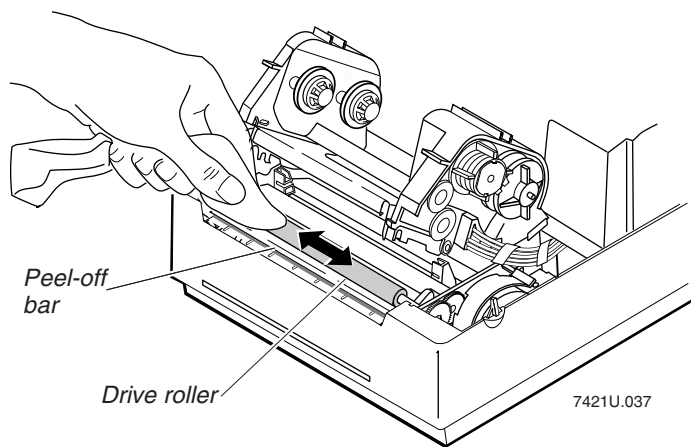
Cleaning the Label Sensors

Three label sensors on the printer require regular cleaning:

- Label taken sensor

- Label mark sensor

- Label gap sensor

To clean the label sensors

1. Turn the printer power off and remove the power cord.

2. Open the printer cover.

3. Open the printhead assembly by pulling the yellow release lever (on the left side of the printer) toward the front of the printer. Lift the printhead up into the full open position.

4. Clean the label taken sensor, the label mark sensor, and the label gap sensor with a cotton swab moistened with isopropyl alcohol.

5. Lower the printhead assembly and lock it into the operating position by pressing down firmly on both sides of the printhead.

6. If you are finished cleaning, lower the printer cover.

Label
taken
sensor

Label gap
sensor

Label
mark
sensor

7421U.038

4

Troubleshooting

This chapter provides some hints for troubleshooting error messages that the printer sends to the host and problems you may experience with the printer.

Troubleshooting Checklist

You may have printer operation, print quality, or printer communications problems at some time during the life of your printer. It is easy to fix most of the errors and consequently not delay operation of the printer for very long.

To troubleshoot your printer

1. First try cleaning the printer components and checking all of the connections. See Chapter 3, "Maintaining the Printer," for details.

2. If cleaning the printer and checking the connections does not solve the problem, use the following tables to locate the symptom. Follow the solution in the table to fix your problem.

If you receive an error message on your PC, refer to your *IPL Programming Reference Manual* for a complete list of error messages and their solutions.

If the problem persists, contact your Intermec Customer Service Representative:

In the U.S.   1.800.755.5505
In Canada   1.800.688.7043

If you are an international customer, contact your local Intermec representative.

Printer Operation Problems

If your printer is not operating correctly, try locating the problem in the table below.

Symptom	Possible Causes	Solution
No power or loss of power.	You have damaged or disconnected the power cable.	Make sure you have plugged the power cable into both the printer and a power source. Replace the cable if damaged.
The Power light flashes red and printing stops.	Printhead has overheated.	Let the printer cool down. It will resume printing on its own.
Test configuration label does not print.	You have incorrectly loaded media.	Try reloading the media. For help, see "Loading Media" in the *7421 Printer Setup Guide*.
Printing stops and the Power light glows orange.	Media fault.	Possible problem with the label gap sensor. Adjust the label sensor. For help, see "Adjusting the Label Gap Sensor" in Chapter 2.
	Label jam.	Remove any jammed labels from the printer and clean the printhead. For help, see "Cleaning the Printhead" in Chapter 3.
	The printhead is up.	Make sure the printhead is down. Cycle printer power and press the Feed/Pause button to resume printing.
	You have incorrectly loaded the media.	Try reloading the media. For help, see "Loading Media" in the *7421 Printer Setup Guide*.
Printer appears to be working but nothing prints.	Media loaded incorrectly.	If you are using direct thermal media, make sure the roll is loaded with the thermal side facing up.
		If you are using thermal transfer media, you must use a thermal transfer ribbon.

Print Quality Problems

If your labels are not being printed properly, check the following table to locate the symptom and correct the problem.

Symptom	Possible Causes	Solution
Blotches printing on labels.	Dirty printhead.	Clean the printhead. For help, see "Cleaning the Printhead" in Chapter 3.
Printing is too light or too dark.	Poor quality label or ribbon stock.	Use only Intermec label and ribbon stock to ensure superior print quality and product performance.
	Incorrect media sensitivity setting.	Change sensitivity setting to match the type of media you are using. If you set the sensitivity setting correctly, try changing the dark adjust. For help, see your PrintSet online help or the *IPL Programming Reference Manual.*
Labels are not stopping at the right point for removal.	You have not set the label rest point command correctly.	Adjust the label rest point. For help, see your PrintSet online help or the *IPL Programming Reference Manual.*
Print quality is poor.	Printhead is dirty.	Clean the printhead. For help, see "Cleaning the Printhead" in Chapter 3.
	Poor quality label or ribbon stock.	Use only Intermec label and ribbon stock to ensure superior print quality and product performance.
	Ribbon wrinkling.	Check to make sure that you installed the ribbon correctly. For help, see "Loading Thermal Transfer Media and Ribbon" in the *7421 Printer Setup Guide.*

Communication Problems

If your printer is not receiving downloaded data, try the
solutions in this table.

Symptom	Possible Causes	Solution
Printer does not communicate with the host.	Incorrect communications parameters.	Use PrintSet to make sure that you have the correct communications parameters set (such as baud rate).
	Damaged or incorrect I/O cable.	Check the connections at both ends or replace the cable. See Appendix B for cable information.

Using Data Line Print Mode

Use Data Line Print mode to troubleshoot communications
between the printer and the host, and to test the operation of the
printer. When the printer is in Data Line Print mode, it prints out
all downloaded data with the hexadecimal equivalent directly
underneath it.

To enter Data Line Print mode

1. Turn the On/Off switch to the off position.

2. Press down and hold the Feed/Pause button while turning on
   the printer.

   The hardware configuration test label prints out and the
   firmware program and version number are sent to the host.
   You are now in Data Line Print mode.

3. Send a few characters down from the host. The printer prints
   out your data with the hexadecimal equivalent directly
   underneath it.

4. Hold the Feed/Pause button down to momentarily suspend the test. The printer prints a software configuration test label.

5. If you press the Feed/Pause button again, the pitch label prints.

To exit Data Line Print mode

1. Turn the printer power off.

2. Turn the printer power back on.

Preventing Data Loss

Several problems can cause data loss or communications problems on the printer. Data loss can result in printing errors or missing field data.

Hardware handshaking involves the use of a hardware wire. Software handshaking involves a two-way datalink between the devices. The two devices communicate with each other without losing data through the use of handshaking. The printer sends both forms of handshaking simultaneously when the printer's input buffer is full. Any loss of data can cause printing errors or missing data.

Hardware handshaking uses pin 6 or pin 9 of the RS-232 interface to control data flow. When the printer is using Intermec Standard protocol, it holds pins 6 and 9 high when the printer is ready to receive data. For help on understanding printer protocol, see Appendix B, "Communications Reference."

The printer holds pins 6 and 9 low when the printer is in one of these conditions:

- Buffer full

- Ribbon fault

- No label stock

- Label at peel-off bar

Your printer uses XON/XOFF protocol for software handshaking. When the input buffer is full, the printer transmits an XOFF character. This action alerts the host to the fact that the printer buffer is full and cannot receive any more data. When the printer is ready to receive more data, it sends the XON character.

To check for communications problems

1. Check the cabling from the printer to the host system.

2. Check the interfacing of the devices that are communicating with the printer.

3. Check the printer for proper electrical operation of the I/O port.

4. Test to see that the host system is not overrunning the printer's input buffer.

5. Check to see that the data string being sent to the printer contains the correct information.

Resetting the Printer to Factory Defaults

Use memory reset if you want to return the printer to its default configuration.

To reset the printer to factory defaults

1. Turn off the printer.

2. Lift the printhead and remove all label stock from the paper path.

3. Turn the printer on while holding down the Feed/Pause button.

4. When the print mechanism starts to move, release the Feed/Pause button and press it again. The Power light should now be flashing red.

5. Press and hold the Feed/Pause button down for 8 seconds or until the Power light stops flashing. The printer resets all parameters to their factory default settings.

A

Printer Specifications

Printer Specifications

This section describes the specifications for the 7421 printer.

Character Sets
- US ASCII
- UK ASCII
- German
- 8-bit ASCII
- Norwegian/Danish
- Swedish/Finnish
- Italian
- Code Page 850
- French
- Swiss
- Spanish

Communications
- Asynchronous RS-232C, IEEE 1284 Bi-directional Parallel
- Serial ASCII code
- Hardware (Ready/Busy) Flow Control
- XON/XOFF Protocol
- Intermec Standard Block Protocol
- Baud Rates: 1200, 2400, 4800, 9600, 19200

Dimensions (no options installed)
Height	7 inches (17.8 cm)
Width	8 inches (20.3 cm)
Length	10 inches (25.4 cm)
Weight	4.5 pounds (2.0 kg)

Electrical Requirements, External Power Supply
Input Voltage	~100 to 240V
Frequency	50-60 Hz
Current	2A maximum

Electrical Requirements, Printer
Input Voltage	⎓19-21V
Current	2,5A

Environment
Operating	40°F to 104°F (5°C to 40°C)
Humidity	10% to 90% noncondensing

Fonts and Graphics

The printer contains 21 resident bitmap fonts and three outline fonts. You can use font ID 3 through 6 and 8 through 19 to download user-defined fonts. See Appendix C, "Character Sets," for complete tables of all available fonts and their character sets.

Media Specifications

Roll	1,800 inches (46 m)
Label Length	0.38 inch (10 mm) to 8.0 inches (203mm)
Web Width	1.12 inches minimum (28 mm) 4.65 inches maximum (118 mm)
Thickness	0.0059 inch minimum (0.15 mm) 0.010 inch maximum (0.25 mm)
Roll Inner Diameter	1.0 inch (25 mm)
Roll Outer Diameter	5 inches maximum (127 mm)

Memory

Base	512K of DRAM
Optional	1 or 4MB flash RAM modules

Printhead

Printed dot size	0.005 inch square (0.13 mm)
Width	4.1 inches maximum (104 mm)
Resolution	203 dots per inch (8 dots per mm)
Number of elements	832 per printhead
"X" dimensions	10 mil to 50 mil (0.25 mm to 1.27 mm); 5 mil (0.13 mm) in drag printing (specified media only)

Printing Method

The 7421 printer is capable of direct thermal (DT) printing or optional thermal transfer (TTR) printing using thermal transfer ribbon.

Printing Speed
2 inches per second (50.8 mm per second)

Ribbon Specifications
Roll	3,582 linear inches (91 m)
Widths	1.33 inches (34 mm)
	2.5 inches (64 mm)
	3.29 inches (84 mm)
	4.33 inches (110 mm)
Diameter	1.39 inches maximum (35 mm)

Printer Options

This section contains a list of the options you can use with the printer along with a brief description. Consult your Intermec representative to order any option.

Battery Pack The battery pack allows you to take your printer anywhere without the need to attach it to a power supply. When the battery pack is fully charged, you can run the printer for approximately 8 hours and print up to 500 labels.

Cutter Use the cutter option to cut continuous media into individual labels ready for use. This option works best for individual random lengths or short batches of different label lengths.

Memory Expansion The memory expansion card is available in 1 or 4 MB flash modules. You can use the flash memory cards for the storage of single- or double-byte fonts, and bitmap graphics.

Bar Code Symbologies Supported

The 7421 printer supports these bar code symbologies:

- Codabar
- Code 2 of 5
- Code 11
- Code 16K
- Code 39
- Code 49
- Code 93
- Code 128
- Code One
- Data Matrix
- EAN
- HIBC
- Interleaved 2 of 5
- Maxicode
- PDF417
- POSTNET
- UPC

B

Communications Reference

About Communications

The 7421 printer supports both serial and parallel communications. Using the parallel interface with an IEEE 1284 parallel interface cable (Part No. 590124) provides the best performance.

Your printer has the following hardware and software requirements:

- The host computer must use the American Standard Code for Information Exchange (ASCII) for data communications.

- A serial port or a parallel port must be available on the host if you are connecting directly to the printer.

- The host must support the RS-232 or data communications interface.

For information on configuring the host computer, port concentrator, or network controller, see the reference manual for the controlling device.

Serial Communication Protocols

Communication protocols are important because they determine the transmission standards for communications between the printer and the host. The printer and the host must use the same protocol and parameters to communicate properly. The printer supports the flow control and block transfer protocols described in the next sections. All of these protocols are point-to-point. Application programs and/or ROM BIOS determine which protocols your computer can support. For more detailed information, refer to the Intermec *Data Communications Reference Manual* (Part No. 044737).

Intermec Printer Standard Protocol

Intermec Printer Standard Protocol is a half-duplex protocol. All data transmission to the printer consists of status enquiry (ENQ), status dump (VT), or message blocks. Each message block starts with the Start of Text (STX) characters and ends with the End of Text (ETX) characters. Each message block must be 255 characters or less, including the STX and ETX characters.

The printer returns its highest priority status when it receives a valid block (<STX> data <ETX>) or when it receives the status request command <ENQ>. When the printer receives the status dump command (<VT>), the printer returns all active status. The printer status response time ranges from 30 ms to 100 ms depending on the complexity of the received message block. In the case of a transmission error, the printer responds with a <NAK> and discards the entire message block.

The table below shows printer status conditions in descending order of priority:

Printer Status	Character
Buffer already full	GS
Ribbon fault	US
No label stock	EM
Buffer now full	DC3
Printhead hot	SI
Label at strip pin	FS
Skipping	DC1
Printing	DC1
Ready/Online	DC1

Note: Do not confuse the Buffer now full <DC3> status with the XON/XOFF characters <DC1> and <DC3>.

When the printer returns Buffer Now Full (<DC3>) status, it accepts the currently received message block. At this time, the printer can accept short messages to allow parsing of immediate commands such as Reset (<DLE>) or Cancel Batch Printing (<EM>). However, if the printer responds with a <GS> to any message block, the buffer is already full and the printer discards the entire message block. In case of a transmission error, the printer discards the whole message block and responds with a Negative Acknowledgment (NAK). You should retransmit the message block from the host.

XON/XOFF Protocol

XON/XOFF protocol uses the ASCII characters <DC1> (XON) and <DC3> (XOFF) to start and stop the flow of data from the host to the printer. The printer does not restrict the message length for XON/XOFF protocol. That is, the printer processes information as it is being downloaded and stops when there is no more information.

<STX> and <ETX> are optional characters. However, if you send an STX, the printer ignores all other characters until you send an ETX.

Intermec provides two versions of the XON/XOFF protocol. The Intermec version of XON/XOFF has the printer respond to each message with its current status. The other version conforms to generally accepted industry standards that include no end-of-message response being sent to the host other than XOFF. In addition, a DC3 is sent to the host if the printer is offline or if media fault occurs. An XON is sent on power up.

Since the printer uses DC1 and DC3 for data flow control, the printer status characters are different from those of the Standard Protocol.

Printer Status	Character
Buffer already full	GS
Ribbon fault	US
No label stock	EM
Printhead hot	SI
Buffer now full	DC4
Label at strip pin	FS
Label skipping	DC2
Printing	DC2
Ready	DC2

If the host ignores the printer sending an XOFF, the printer resends an XOFF after receiving every 15 characters from the host. In the case of transmission error, the printer discards the characters with the error and keeps the rest of the message block.

Hardware Protocol

The printer uses Ready/Busy and DTR (data terminal ready) of the RS-232C interface to indicate the printer's status. You can configure Ready/Busy and DTR independent of each other and independent of the software protocol you select for the serial port. You can set each pin to one of these four settings: default, high, flow control, and Ready/Busy.

When you set the pin to high, it stays high as long as the printer is powered up.

When you set the pin to flow control, the pin is high when the printer status is ready. The pin is held low when the printer is offline or if the buffer is full.

When you set the pin to Ready/Busy, the pin is high when the printer status is ready. The pin is held low when the printer is in one of these conditions:

- Offline
- Buffer full
- No label stock
- Ribbon fault
- Label at strip pin

When you set the pin to default, it uses flow control if the serial port is set for XON/XOFF protocol. If you are using Intermec Standard protocol, the printer uses Ready/Busy.

User-Defined Protocol

The printer provides the capability to change protocol characters. However, users may not define their own protocol. You can substitute characters you want to use as protocol characters, but the rules for the chosen protocol do not change. The printer does not use any protocol characters that you replace with the NUL character. One table of protocol characters exists. You may redefine these characters to create a table that all of the protocols can use. One possibility for the user to redefine protocol characters might be the replacement of control characters with printable characters.

Note: *Please use caution when replacing control characters with printable characters. You cannot replace one control character with more than one printable character.*

The following table lists the protocol characters that you can redefine and the protocols they affect:

Character	Protocol Affected
SOM IN	STD, XON/XOFF
EOM IN	STD, XON/XOFF
DLE IN	STD, XON/XOFF
XON IN	XON/XOFF
XOFF IN	XON/XOFF
NEG OUT	STD
DLE OUT	STD
XON OUT	XON/XOFF
XOFF OUT	XON/XOFF
PROTO-CMD 1	STD, XON/XOFF
PROTO-CMD 2	STD, XON/XOFF

Communications Boundaries

The information below applies to all protocols that the printer supports.

Parameter	Maximum Capacity
Message delay	9999 milliseconds
Character delay	9999 milliseconds
Message block size	255 characters (including STX and ETX characters) Unlimited block size for XON/XOFF

RS-232 Serial Interface

The printer supports serial communications with the RS-232 interface. Use the RS-232 serial interface in all asynchronous point-to-point full- or half-duplex direct data communications. The printer cable must have the pin assignments for an RS-232 serial interface shown in the following table.

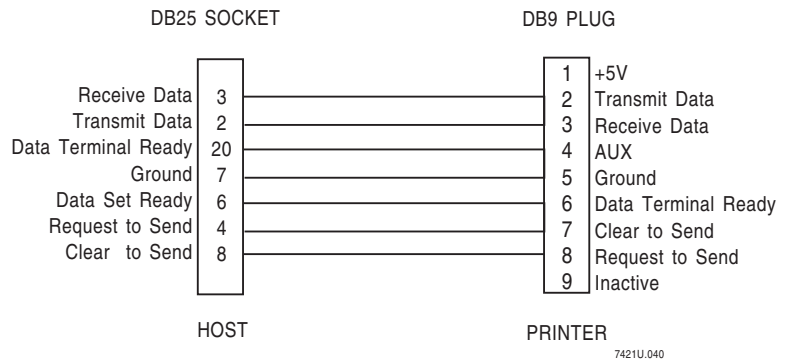| Pin	Name	Operation
3	Receive Data	Input: Connect to transmit data pin of connected device.
2	Transmit Data	Output: Connect to receive data pin of connected device.
6	Data Terminal Ready (DTR)	Output: When you use a modem, connect to modem DTR pin. When using Intermec Standard Protocol, this pin indicates that the printer is switched on. When using XON/XOFF or hardware flow control, this pin indicates the printer mechanical status and the status of the printer input buffer.
5	Ground	To enable communications, connect to signal ground of connected device. Completes circuit for all RS-232 signals.
7	Clear to Send (CTS)	Input: When you use a modem, connect to modem CTS pin. The modem must set CTS true before the printer transmits data. If not connected, CTS sets itself true.
8	Request to Send (RTS)	Output: When you use a modem, connect to modem RTS pin. The modem sets RTS to true before transmission. The printer sets RTS to false after transmission.
9	Printer Status	Output: When not using software flow control (XON/XOFF), connect to input of connected device (for example, CTS). Indicates printer mechanical status and status of printer input buffer.

RS-232 Cable for 9-pin to 9-pin (Part No. 590123)

DB9 SOCKET   DB9 PLUG

	1		1	+5V
Receive Data	2		2	Transmit Data
Transmit Data	3		3	Receive Data
Data Terminal Ready	4		4	AUX
Ground	5		5	Ground
Data Set Ready	6		6	Data Terminal Ready
Request to Send	7		7	Clear to Send
Clear to Send	8		8	Request to Send
Ring Indicator	9		9	Inactive

AT   PRINTER

7421U.39
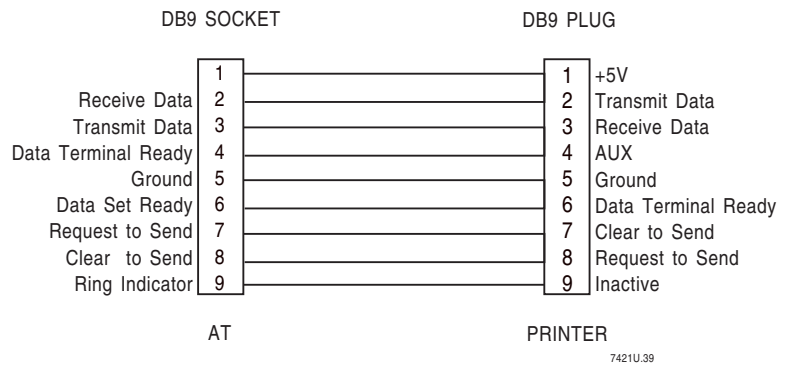
RS-232 Null Modem Cable for PC for 25-pin to 9-pin

DB25 SOCKET   DB9 PLUG

			1	+5V
Receive Data	3		2	Transmit Data
Transmit Data	2		3	Receive Data
Data Terminal Ready	20		4	AUX
Ground	7		5	Ground
Data Set Ready	6		6	Data Terminal Ready
Request to Send	4		7	Clear to Send
Clear to Send	8		8	Request to Send
			9	Inactive

HOST   PRINTER

7421U.040

C

Character Sets

This chapter contains tables for the character sets that the 7421 supports. To select a character set, use PrintSet, your third-party software application, or the IPL command set.

International Character Sets

The following tables show which hex codes to download for international characters not available in the U.S. character set. To use the tables, find the hex code for the U.S. character that corresponds with the character in your language.

Advanced Character Table

If you are running your printer in Advanced mode (you are not using 86XX Emulation), use this table to find the right hex codes for the international character sets.

	23	24	40	5E	5C	5D	5E	60	7E	7C	7D	7E
U.S. ASCII	#	$	@	[	\	]	^	`	{	¦	}	~
U.K. ASCII	£	$	@	[	\	]	^	`	{	¦	}	‾
Germany	#	$	§	Ä	Ö	Ü	^	`	ä	ö	ü	ß
France	£	$	à	°	ç	§	^	`	é	ù	è	_
Norway/Denmark	#	$	@	Æ	Ø	Å	^	`	æ	ø	å	¨
Sweden/Finland	#	¤	É	Ä	Ö	Å	Ü	é	ä	ö	å	ü
Spain	£	$	§	¡	Ñ	¿	^	`	°	ñ	ç	~
Switzerland	#	$	à	°	ç	é	^	ù	ä	ö	ü	è
Italy	£	$	§	°	ç	é	^	ù	à	ò	è	ì
Code Page 850	#	$	@	[	\	]	^	`	{			}	~

86XX Character Table

This table shows the hex codes for the character sets that print if your printer is running under Emulation mode.

	23	24	40	5B	5C	5D	5E	60	7B	7C	7D	7E
U.S. ASCII	#	$	@	[	\	]	^	`	{	¦	}	~
U.K. ASCII	£	$	@	[	\	]	^	`	{	¦	}	~
Germany	#	$	§	Ä	Ö	Ü	^	`	ä	ö	ü	ß
France	£	$	à	°	ç	§	^	`	é	ù	è	¨
Norway/Denmark	#	$	@	Æ	Ø	Å	^	`	æ	ø	à	~
Sweden/Finland	#	¤	É	Ä	Ö	Å	Ü	é	ä	ö	å	ü
Spain	P$_t$	$	@	¡	Ñ	¿	^	`	¨	ñ	ç	~
Switzerland	#	$	à	°	ç	é	^	ù	ä	ö	ü	è
Italy	#	$	§	°	ç	é	^	ù	à	ò	è	ì
Code Page 850	#	$	@	[	\	]	^	`	{			}	~

IBM Translation Character Table

If you are running your printer with IBM Translation enabled, use this table to find the right hex codes for the international character sets.

	4F	7B	5B	7C	4A	E0	5A	5F	79	C0	6A	D0	A1
U.S. ASCII	¦	#	$	@	¢	\	!	¬	`	{	¦	}	~
U.K. ASCII	¦	#	£	@	$	\	!	¬	`	{	¦	}	_
Germany	!	#	$	§	Ä	Ö	Ü	^	`	ä	ö	ü	ß
France	!	£	$	à	°	ç	§	^	`	é	ù	è	¨
Norway/ Denmark	!	Æ	Å	Ø	#	\	¤	^	`	æ	ø	å	ü
Sweden/ Finland	!	Ä	Å	Ö	§	É	¤	^	é	ä	ö	å	ü
Spain	¦	Ñ	P$_t$	@	[	\	]	¬	`	{	ñ	}	¨
Switzerland	!	#	$	à	°	ç	é	^	ù	ä	ö	ü	è
Italy	!	£	$	§	°	ç	é	^	ù	à	ò	è	ì
Code Page 850	!	#	$	@	[	\	]	^	`	{			}	~

Code Page 850 Character Table

	x0	x1	x2	x3	x4	x5	x6	x7	x8	x9	xA	xB	xC	xD	xE	xF
0x	(00)	☺	☻	♥	♦	♣	♠	●	◘	○	◙	♂	♀	♪	♫	☼
1x	►	◄	↕	‼	¶	§	▬	↨	↑	↓	→	←	∟	↔	▲	▼
2x	(20)	!	"	#	$	%	&	'	(	)	*	+	,	-	.	/
3x	0	1	2	3	4	5	6	7	8	9	:	;	<	=	>	?
4x	@	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
5x	P	Q	R	S	T	U	V	W	X	Y	Z	[	\	]	^	_
6x	`	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o
7x	p	q	r	s	t	u	v	w	x	y	z	{	|	}	~	⌂
8x	Ç	ü	é	â	ä	à	å	ç	ê	ë	è	ï	î	ì	Ä	Å
9x	É	æ	Æ	ô	ö	ò	û	ù	ÿ	Ö	Ü	ø	£	Ø	×	ƒ
Ax	á	í	ó	ú	ñ	Ñ	ª	º	¿	®	¬	½	¼	¡	«	»
Bx	░	▒	▓	│	┤	Á	Â	À	©	╣	║	╗	╝	¢	¥	┐
Cx	└	┴	┬	├	─	┼	ã	Ã	╚	╔	╩	╦	╠	═	╬	¤
Dx	ð	Ð	Ê	Ë	È	ı	Í	Î	Ï	┘	┌	█	▄	¦	Ì	▀
Ex	Ó	ß	Ô	Ò	õ	Õ	µ	þ	Þ	Ú	Û	Ù	ý	Ý	¯	´
Fx		±	‗	¾	¶	§	÷	¸	°	¨	·	¹	³	²	■	(FF)

7421U.042

Extended Character Sets

Each internal font in the 7421 has a different character set associated with it as shown in the following tables. The hex codes accompany each character.

Characters in Fonts	c0	7 x 9 Standard
	c1	7 x 11 OCR
	c2	10 x 14 Standard
	c7	5 x 7 Standard

NL 00	SH 01	SX 02	EX 03	ET 04	EQ 05	AK 06	BL 07	BS 08	HT 09	LF 0A	VT 0B	FF 0C	CR 0D	SO 0E	SI 0F
DL 10	D1 11	D2 12	D3 13	D4 14	NK 15	SN 16	EB 17	CN 18	EM 19	SB 1A	EC 1B	FS 1C	GS 1D	RS 1E	US 1F
20	! 21	" 22	# 23	$ 24	% 25	& 26	' 27	(28	) 29	* 2A	+ 2B	, 2C	– 2D	. 2E	/ 2F
0 30	1 31	2 32	3 33	4 34	5 35	6 36	7 37	8 38	9 39	: 3A	; 3B	< 3C	= 3D	> 3E	? 3F
@ 40	A 41	B 42	C 43	D 44	E 45	F 46	G 47	H 48	I 49	J 4A	K 4B	L 4C	M 4D	N 4E	O 4F
P 50	Q 51	R 52	S 53	T 54	U 55	V 56	W 57	X 58	Y 59	Z 5A	[5B	\ 5C	] 5D	^ 5E	_ 5F
` 60	a 61	b 62	c 63	d 64	e 65	f 66	g 67	h 68	i 69	j 6A	k 6B	l 6C	m 6D	n 6E	o 6F
p 70	q 71	r 72	s 73	t 74	u 75	v 76	w 77	x 78	y 79	z 7A	{ 7B	| 7C	} 7D	~ 7E	▓ 7F
Rt 80	à 81	■ 82	□ 83	△ 84	△ 85	86	87	88	89	8A	8B	8C	8D	8E	8F
90	91	92	93	94	95	96	97	98	99	9A	9B	9C	9D	9E	9F
A0	¡ A1	A2	£ A3	¤ A4	¥ A5	A6	§ A7	¨ A8	A9	AA	AB	AC	AD	AE	AF
◦ B0	B1	B2	B3	B4	B5	B6	B7	B8	B9	BA	BB	BC	BD	BE	¿ BF
C0	C1	C2	C3	Ä C4	Å C5	Æ C6	C7	C8	É C9	CA	CB	CC	CD	CE	CF
D0	Ñ D1	D2	D3	D4	D5	Ö D6	D7	Ø D8	D9	DA	DB	Ü DC	DD	DE	ß DF
à E0	E1	E2	E3	ä E4	å E5	æ E6	ç E7	è E8	é E9	EA	ë EB	ì EC	ED	EE	EF
F0	ñ F1	ò F2	F3	F4	F5	ö F6	F7	ø F8	ù F9	FA	FB	ü FC	FD	FE	FF

7421U.044

Characters in Fonts	c20	8 point
	c21	12 point
	c22	20 point
	c25, c26, c28	outline fonts
	c30-c41	monospace fonts

ØØ	Ø1	Ø2	Ø3	Ø4	Ø5	Ø6	Ø7	Ø8	Ø9	ØA	ØB	ØC	ØD	ØE	ØE
1Ø	11	12	13	14	15	16	17	18	19	1A	1B	1C	1D	1E	1F
2Ø	! 21	⊓ 22	# 23	⇟ 24	% 25	& 26	▎ 27	(28	) 29	✳ 2A	+ 2B	¬ 2C	— 2D	. 2E	/ 2F
☐ 3Ø	1 31	2 32	3 33	4 34	5 35	6 36	7 37	8 38	9 39	: 3A	; 3B	< 3C	= 3D	> 3E	? 3F
@ 4Ø	A 41	B 42	C 43	D 44	E 45	F 46	G 47	H 48	I 49	J 4A	K 4B	L 4C	M 4D	N 4E	O 4F
P 5Ø	Q 51	R 52	S 53	T 54	U 55	V 56	W 57	X 58	Y 59	Z 5A	[5B	\ 5C	] 5D	^ 5E	￥ 5F
⌐ 6Ø	a 61	b 62	c 63	d 64	e 65	f 66	g 67	h 68	i 69	j 6A	k 6B	l 6C	m 6D	n 6E	o 6F
p 7Ø	q 71	r 72	s 73	t 74	u 75	v 76	w 77	x 78	y 79	z 7A	{ 7B		7C	} 7D	♪ 7E	■ 7F
8Ø	81	82	83	84	85	86	87	88	89	8A	8B	8C	8D	8E	8F
9Ø	91	92	93	94	95	96	97	98	99	9A	9B	9C	9D	9E	9F
AØ	A1	A2	£ A3	A4	￥ A5	A6	A7	A8	A9	AA	AB	AC	AD	AE	AF
BØ	B1	B2	B3	B4	B5	B6	B7	B8	B9	BA	BB	BC	BD	BE	BF
CØ	C1	C2	C3	Ä C4	Å C5	Æ C6	C7	C8	C9	CA	CB	CC	CD	CE	CF
DØ	Ñ D1	D2	D3	D4	D5	Ö D6	D7	Ø D8	D8	DA	DB	Ü DC	DD	DE	DF
EØ	E1	E2	E3	E4	E5	E6	E7	E8	E9	EA	EB	EC	ED	EE	EF
FØ	F1	F2	F3	F4	F5	F6	F7	F8	F9	FA	FB	FC	FD	FE	FF

7421U.047

Note: *You cannot print these characters as 4 x 4 inch graphics because there is white space surrounding the characters that prevents the image from reaching the maximum graphic size.*

ØØ	Ø1	Ø2	Ø3	Ø4	Ø5	Ø6	Ø7	Ø8	Ø9	ØA	ØB	ØC	ØD	ØE	ØE
1Ø	11	12	13	14	15	16	17	▬ 18	19	1A	1B	1C	1D	1E	1F
2Ø	! 21	▛ 22	# 23	≑ 24	% 25	& 26	▮ 27	(28	) 29	✳ 2A	+ 2B	¬ 2C	— 2D	. 2E	/ 2F
☐ 3Ø	1 31	2 32	∃ 33	4 34	5 35	6 36	7 37	8 38	9 39	꞉ 3A	⁏ 3B	< 3C	= 3D	> 3E	? 3F
﴾ 4Ø	A 41	B 42	⊂ 43	D 44	E 45	F 46	G 47	H 48	I 49	J 4A	K 4B	L 4C	M 4D	N 4E	◇ 4F
P 5Ø	Q 51	R 52	Z 53	T 54	U 55	V 56	W 57	X 58	Y 59	Z 5A	⊏ 5B	\ 5C	⊐ 5D	∧ 5E	¥ 5F
⊢ 6Ø	a 61	b 62	c 63	d 64	e 65	f 66	g 67	h 68	i 69	j 6A	k 6B	l 6C	m 6D	n 6E	o 6F
p 7Ø	q 71	r 72	s 73	t 74	u 75	v 76	w 77	x 78	y 79	z 7A	{ 7B	| 7C	} 7D	♪ 7E	■ 7F
8Ø	81	82	83	84	85	86	87	88	89	8A	8B	8C	8D	8E	8F
9Ø	91	92	93	94	95	96	97	98	99	9A	9B	9C	9D	9E	9F
AØ	A1	A2	£ A3	A4	¥ A5	A6	A7	A8	A9	AA	AB	AC	AD	AE	AF
BØ	B1	B2	B3	B4	B5	B6	B7	B8	B9	BA	BB	BC	BD	BE	BF
CØ	C1	C2	C3	Ä C4	Å C5	Æ C6	C7	C8	C9	CA	CB	CC	CD	CE	CF
DØ	Ñ D1	D2	D3	D4	D5	Ö D6	D7	Ø D8	D8	DA	DB	Ü DC	DD	DE	DF
EØ	E1	E2	E3	E4	E5	E6	E7	E8	E9	EA	EB	EC	ED	EE	EF
FØ	F1	F2	F3	F4	F5	F6	F7	F8	F9	FA	FB	FC	FD	FE	FF

7421U.047

ØØ	Ø1	Ø2	Ø3	Ø4	Ø5	Ø6	Ø7	Ø8	Ø9	ØA	ØB	ØC	ØD	ØE	ØE
1Ø	11	12	13	14	15	16	17	‾ 18	19	1A	1B	1C	1D	1E	1F
! 2Ø	! 21	" 22	# 23	$ 24	% 25	& 26	' 27	(28	) 29	* 2A	+ 2B	, 2C	− 2D	. 2E	/ 2F
0 3Ø	1 31	2 32	3 33	4 34	5 35	6 36	7 37	8 38	9 39	: 3A	; 3B	< 3C	= 3D	> 3E	? 3F
@ 4Ø	A 41	B 42	C 43	D 44	E 45	F 46	G 47	H 48	I 49	J 4A	K 4B	L 4C	M 4D	N 4E	O 4F
P 5Ø	Q 51	R 52	S 53	T 54	U 55	V 56	W 57	X 58	Y 59	Z 5A	[5B	\ 5C	] 5D	^ 5E	_ 5F
` 6Ø	a 61	b 62	c 63	d 64	e 65	f 66	g 67	h 68	i 69	j 6A	k 6B	l 6C	m 6D	n 6E	o 6F
p 7Ø	q 71	r 72	s 73	t 74	u 75	v 76	w 77	x 78	y 79	z 7A	{ 7B	| 7C	} 7D	~ 7E	■ 7F
8Ø	81	82	83	84	85	86	87	88	89	8A	8B	8C	8D	8E	8F
9Ø	91	92	93	94	95	96	97	98	99	9A	9B	9C	9D	9E	9F
AØ	A1	A2	£ A3	¤ A4	¥ A5	¦ A6	§ A7	¨ A8	A9	AA	AB	AC	AD	AE	AF
BØ	B1	B2	B3	´ B4	B5	B6	B7	¸ B8	B9	BA	BB	BC	BD	BE	BF
CØ	C1	C2	C3	Ä C4	Å C5	Æ C6	C7	C8	C9	CA	CB	CC	CD	CE	CF
DØ	Ñ D1	D2	D3	D4	D5	Ö D6	D7	Ø D8	D8	DA	DB	Ü DC	DD	DE	ß DF
EØ	E1	E2	E3	ä E4	å E5	æ E6	E7	E8	E9	EA	EB	EC	ED	EE	EF
FØ	ñ F1	F2	F3	F4	F5	ö F6	F7	ø F8	F9	FA	FB	ü FC	FD	FE	FF

7421U.049

I

Index