Intermec

User's Manual

4630 and 4830 Bar Code Printers

P/N 063879-002

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Outside U.S. and Canada: Contact your local Intermec service supplier.

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Manual Change Record

This page records the changes to this manual, which was originally released as version 001.

Version	Date	Description of Change
002	5/97	Information has been updated to correspond with the printer firmware upgrade. The manual has also been formatted to 8.5 x 11 inches.

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Before You Begin

This section introduces you to standard warranty provisions, safety precautions, warnings and cautions, document formatting conventions, and sources of additional product 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 (800) 688-7043. Otherwise, refer to the Worldwide Sales & Service list 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 the following format.

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.

Note*: 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 install, operate, configure, design labels, troubleshoot, and maintain your Intermec 4630 or 4830 printer.

Terms and Conventions

The following special terms and conventions occur throughout the manual for operating procedures and descriptions of the printer.

- "Printer," "4630," or "4830" refer to the 4630 and 4830 bar code label printers. Unless specifically stated, all information in this manual applies to both printer models.
- "Media" is the label stock on which the printer prints labels.
- "Host" refers to a personal computer or other computer that communicates with the printer.
- On line / Off line, Feed / Reload, and Cancel refer to the keys on the printer control panel.
- Select, Menu, Enter, Cont, ↑, and ↓ refer to the keys on the printer menu panel.
- Messages on the printer display are represented by boxed text:

```
OFFLINE
SERVICE MENU
```

- Downloaded commands appear in the order you enter them into the printer with the following conventions:

Convention	Description
< >	Angle brackets < > enclose mnemonic representations of ASCII control characters. For example, <ETX> represents the ASCII "End of Text" control character.
data	Italic text represents variable data, which you must replace with a real value. For example, *n* signifies a variable for which you must designate a constant value.
[*data*]	Italic text within brackets represents optional data.
Ctrl	Bold text represents a key on your keypad. For example, **Ctrl** represents the Ctrl key and **M** represents the letter M key.
Ctrl-Z	When two keys are joined with a dash, press them simultaneously. For example, if you see the command **Ctrl-C**, press the two keys at the same time.
`E3;F3`	Type all characters that appear in the Courier font by pressing an individual key on the keypad.

Other Intermec Manuals

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

Manual	Intermec Part No.
Data Communications Reference Manual	044737
The Bar Code Book by Roger C. Palmer	051241
4630 and 4830 Bar Code Label Printers Getting Started Guide	063880

1

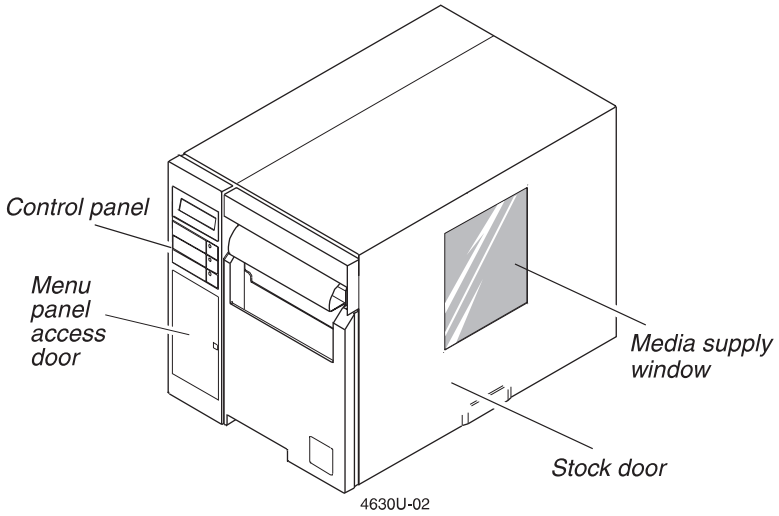
Getting Started

The 4630 and 4830 printers offer many configuration and programming choices, yet they are easy to operate and understand. These printers are designed to quickly produce volumes of high quality labels in harsh environments.

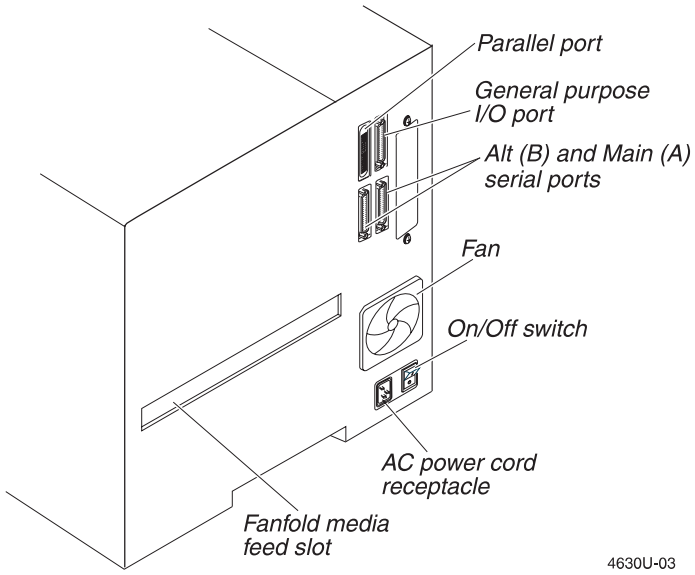
Getting to Know Your Printer

You can use the Intermec 4630 and 4830 printers for both direct thermal and thermal transfer printing applications. The following three illustrations identify the major components of the Intermec 4630 and 4830 printers.

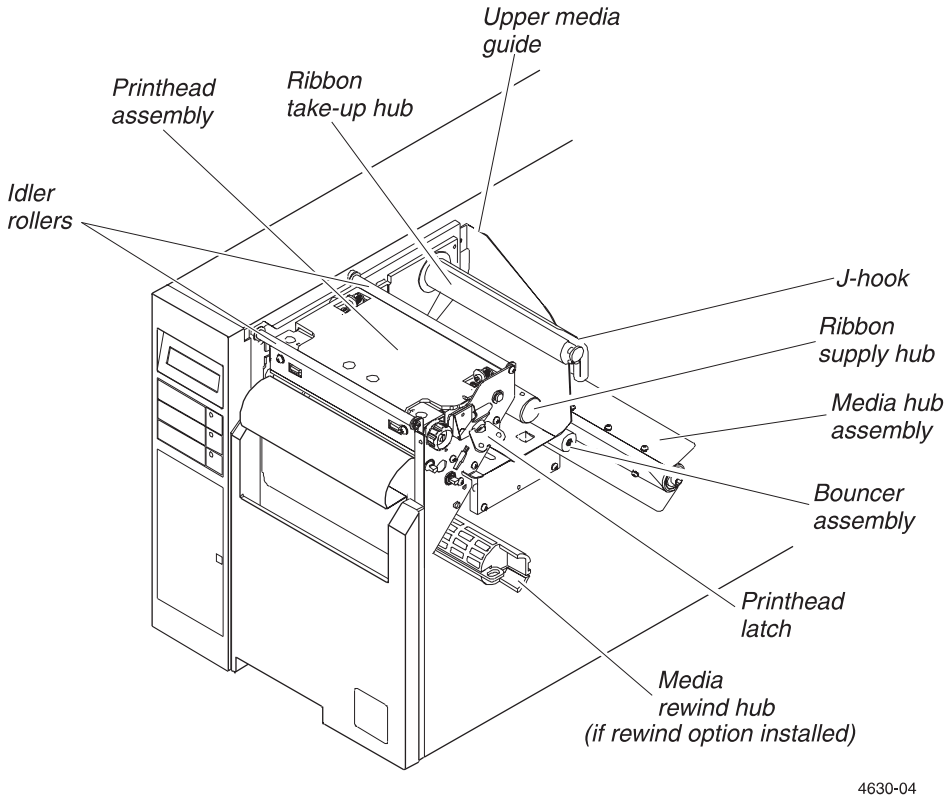
Front View



Back View



Internal View



Preparing the Printer for Installation

Before installing and connecting the printer to your data collection system, use the following guidelines to choose the proper location for the printer.

- Position the printer close to an electrical source.
- Set the printer on a level, sturdy surface.
- Allow easy access to the power switch and the rear panel.
- Make sure the printer fan is kept clear of obstructions and debris.

Plugging in the Printer

The back of the printer contains the AC power receptacle, the serial communications ports, the parallel port, and the On / Off (| / O) switch.

To plug in the printer

1. Make sure the On / Off switch is in the off (O) position.
2. Plug the power cord into the receptacle on the back of the printer.

   Note: *If you are outside the United States and use a 230V power source, contact your Intermec representative for the appropriate power cord.*

3. Plug the other end of the power cord into a grounded wall outlet or surge protector.
4. Turn the On / Off switch to the on (|) position.

   When you turn on the printer, the three indicator lights flash. After the printer is fully powered, the Power and On line indicator lights are lit and the display reads:

   ```
   ONLINE
   READY
   ```

Opening and Closing the Printer

You need to open the printer every time you load media or perform maintenance procedures.

To open the printer

- Grasp the bottom center of the stock door and pull it outward and upward until you can rest the door on top of the printer.

To close the printer

- Grasp the stock door and gently pull it down until it rests against the bottom edge of the printer.

Note: *Before closing the stock door, make sure that the printhead is locked down.*

Choosing the Print Mode and Media

The 4630 and 4830 printers are capable of printing in two modes: direct thermal (DT) and thermal transfer (TTR).

Direct thermal Heat is directly applied from the thermal printhead to produce an image on the print media. This is the default print mode for your printer.

Thermal transfer The individual elements of the printhead apply heat to a ribbon. The "ink" on the ribbon is formulated to melt into the print media to produce an image.

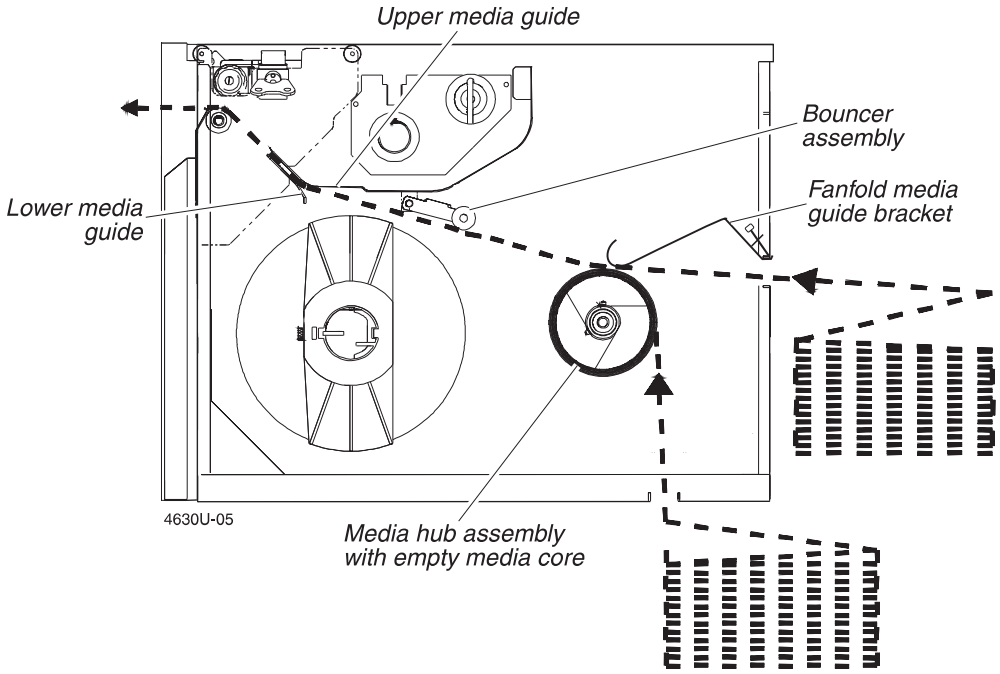
If you want to print in thermal transfer mode, use the menu panel to access the Configuration menu and then select Label, Media Type, Thermal Transfer. For more information on using the menu panel, refer to "Using the Menu Panel" in Chapter 2.

Note: *Do not use direct thermal print media with a thermal transfer ribbon installed. The print quality will be unacceptable.*

Loading Fanfold Media

1. Open the stock door.
2. Raise the printhead latch wing and rotate it counterclockwise one-half turn to unlock the printhead. Lift the printhead to the raised position.
3. Place the media supply behind or beneath the printer and put a blank paper core over the media hub.
4. Install the fanfold media guide bracket on the inside back panel of the printer. The bracket attaches to the upper lip of the fanfold media feed slot.
5. Feed the media through the rear or bottom media loading slot, between the fanfold media guide bracket and the media hub assembly, under the bouncer assembly, and in between the upper and lower media guides until it exits the printhead assembly.
6. Adjust the media edge guide until it just touches the edge of the media.
7. Lower the printhead, engage the printhead latch, and rotate the latch wing clockwise one-half turn to lock the printhead into position.

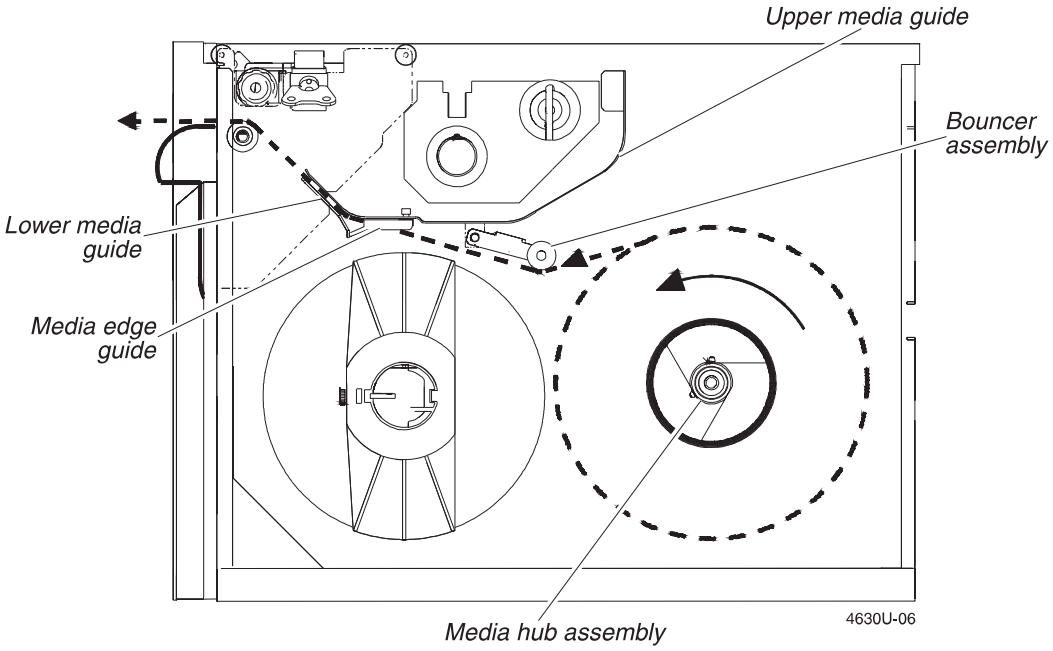
   Note: *You may need to feed several labels through the printer before the media is properly aligned.*



Loading Roll-Fed Media

1. Open the stock door.
2. Raise the printhead latch wing and rotate it counterclockwise one-half turn to unlock the printhead. Lift the printhead to the raised position.
3. Slide the media roll onto the media hub assembly.
4. Route the media under the bouncer assembly and in between the upper and lower media guides until it exits the printhead assembly.
5. Adjust the media edge guide until it just touches the edge of the media.
6. Lower the printhead, engage the printhead latch, and rotate the latch wing clockwise one-half turn to lock the printhead into position.

   Note: *You may need to feed several labels through the printer before the media is properly aligned.*



Loading Thermal Transfer Ribbon

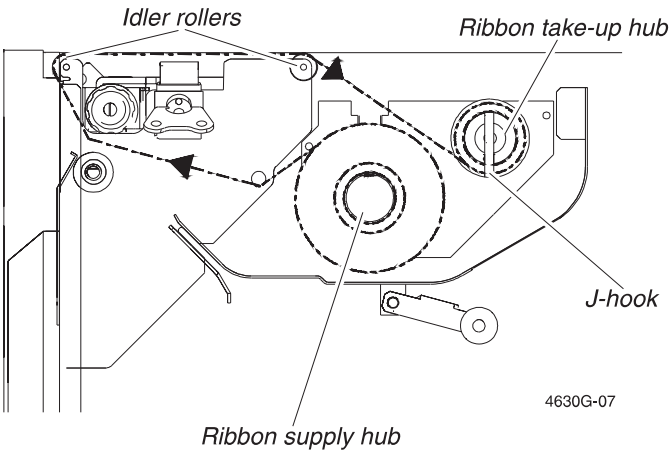
If you want to print in thermal transfer mode, you must install a thermal transfer ribbon on the ribbon supply hub and use thermal transfer media.

To load thermal transfer ribbon

1. Open the stock door.
2. Raise the printhead latch wing and rotate it counterclockwise one-half turn to unlock the printhead. Lift the printhead to the raised position.
3. Remove the J-hook from the ribbon take-up hub by holding the hub and twisting the J-hook counter-clockwise until it disengages.
4. Determine the "inked" side of the ribbon, making sure that it is **down** as it comes off the roll, and then slide the ribbon roll onto the ribbon supply hub, until it is against the hub flange.

   Note: *Depending on the type of ribbon you are using, the ribbon may need to feed from the top or the bottom of the roll. It is important that the "inked" side of the ribbon does not come in contact with the printhead. You can rub a clean piece of paper over both sides of the ribbon to determine which side is "inked."*

5. Pull the free end of the ribbon under the printhead carriage, lower the printhead, and engage the printhead latch. **Do not** lock the printhead into position.



6. Pull the ribbon over the ribbon idler rollers, wrap the free end of the ribbon counterclockwise around the ribbon take-up hub, and slide the J-hook ribbon clasp into place. Rotate the hub until all slack is removed from the ribbon (**do not** use the J-hook to rotate the hub).
7. Rotate the latch wing clockwise one-half turn to lock the printhead into position and then close the stock door.

Printing a Configuration Test Label

Once media is loaded in the printer, you are ready to print the configuration test label. Use this label for reference when connecting the printer to your system and for verifying proper printer operation.

To print the configuration test label

1. Start with the printer display showing OFFLINE READY. You may need to press On line / Off line to get this display.

2. Press and release the menu panel access door to open the door. From the menu panel, press Menu and then press ↑ or ↓ until you reach the Service menu.
3. Press Select and then press ↑ or ↓ until the display shows:

```
SERVICE MENU
PRINT CONFIG
```

4. Press Select and then press ↑ or ↓ until the display shows:

```
PRINT CONFIG
USER DEFINED
```

5. Press Select. The display shows:

```
USER DEFINED
EXECUTE TEST
```

6. Press Enter to print the configuration test label.
7. Press Cont to return to the OFFLINE READY display.

Connecting the Printer to Your System

You can connect the printer to a PC, a local area network, an AS/400 (or other midrange computer), or a mainframe. This section tells you how to connect your printer to any of these systems.

Connecting the Printer to a PC Serial Port

To connect the printer to your PC serial port, you need a shielded EIA RS-232, RS-422, or RS-485 electrical interface with a DB 25-pin connector on the printer end and the appropriate serial port connector on the other end. You can use one of the following Intermec cables:

- P/N 048668 (25-pin printer connector to 25-pin serial port connector)
- P/N 048693 (25-pin printer connector to 9-pin serial port connector)

To connect your printer to a PC serial port

1. Turn off the printer.
2. Plug the 25-pin connector into one of the serial ports on the back panel of the printer: Main port (A) or Alt port (B).
3. Plug the other end of the cable into a serial port (COM port) on the PC.
4. Make sure the serial port settings for your printer and the PC are the same. The default configuration settings for the printer serial ports are: 9600 baud, even parity, 7 data bits, 1 stop bit, and Standard protocol.

Connecting the Printer to a PC Parallel Port

If you are using a parallel port to communicate with the printer, you can purchase a parallel cable from Intermec (P/N 051211).

To connect your printer to a PC parallel port

1. Turn off the printer.
2. Plug the parallel cable connector into the parallel communications port on the back panel of the printer.
3. Plug the DB 25-pin cable connector into the 25-socket parallel port on the PC.

Connecting the Printer to a Network

You can connect the printer to Novell NetWare networks, Token Ring networks, or TCP/IP networks. To connect the printer to a network, you must purchase a network interface adapter. Network adapters are listed in Intermec's Product Links Catalog. The adapters may connect to either serial or parallel ports depending on the adapter you select. Refer to your network documentation for more information.

Connecting the Printer to an AS/400

To connect the printer directly to an AS/400 or midrange system, you need

- a coax/twinax interface adapter card (P/N 063870).
- a twinaxial cable equivalent to IBM P/N 7362267 or 7362062.

The maximum cable length for the twinax interface is 5000 feet (1525 meters).

If the coax/twinax interface adapter was not installed in the printer at the factory, you can have the field installable option (P/N 063870) installed in your printer. Refer to the manual that comes with the interface adapter for more information on cabling and communications.

Note: *If you are using a midrange computer other than the AS/400, refer to your system documentation for information on cabling and setting up communications.*

Connecting the Printer to a Mainframe

To connect the printer directly to an IBM mainframe, you need

- a coax / twinax interface adapter (P / N 063870).
- a coaxial cable equivalent to IBM P / N 2577672 or 1833108.

The maximum cable length allowed is 4920 feet (1500 meters). See the IBM specification *Installation and Assembly of Coaxial Cable and Accessories*, part number GA27-2805-4, for further information.

If the coax / twinax interface adapter was not installed in the printer at the factory, you can have the field installable option (P / N 063870) installed in your printer. Refer to the manual that comes with the interface adapter for more information on cabling and communications.

Cabling in Noisy Electrical Environments

The items listed below create noisy electrical environments that can disrupt data communications between your host computer and the printer:

- Large power transformers
- Large electrical motors
- Arc welders
- Motor controllers
- Switch gears

If any of these items are near your printer, you may want to try any of the following suggestions to reduce the effects of electrical noise. If you need help eliminating noise, ask your Intermec representative for assistance.

- Always use shielded cable. Connect the cable and shield to the metal backshells on the cable connectors and fasten the connectors to the serial ports using screws.
- Install ferrite cable clamps.
- Connect the printer chassis ground to the building ground. You will find the chassis ground on the ground pin of the printer power cord.

Configuring the Serial Ports

The serial port settings of the printer should match those of your PC or network controlling device. If the default settings do not match your configuration needs, you can use the menu panel to access the MAIN PORT or ALT PORT menus to change them.

The printer serial port settings and the default values (*) are listed below.

Parameter	Settings
Baud Rate	110, 300, 600, 1200, 2400, 4800, 9600*, 19200
Data Bits	7* or 8
Message Length	255*, 512
Parity	Odd, Even*, Mark, Space, Off
Stop Bits	1* or 2
Protocol	Standard*, XON / XOFF, XON / XOFF No Status, Multi-Drop, Polling Mode D

A faster communications configuration than the printer default is: 19200 baud, no parity, 8 data bits, 1 stop bit, and XON / XOFF No Status protocol.

Note: *You need to configure the printer serial port for 8 data bits if you want to print Code Page 850 or 8 bit ASCII character sets. Also, use XON/XOFF protocol for READY/BUSY buffer control.*

To configure the printer serial ports

1. From the OFFLINE READY display, press Menu and then press ↑ or ↓ until you reach the Install menu.
2. Press Select and then press ↑ or ↓ until the display shows:

INSTALL MENU MAIN PORT	or	INSTALL MENU ALT PORT

3. Press Select and then press ↑ or ↓ to scroll through the available commands.
4. Press Select when you reach the command you want to change. The current setting is shown with an asterisk (*).
5. Press ↑ or ↓ to scroll through the available settings for the command and then press Enter to activate the setting you want.

6. Do one of the following:
   - Press Cont to return to the OFFLINE READY display.
   - Press Menu and repeat Steps 3 through 5 to change other serial port settings.

Note: *You must cycle the printer power (turn off the printer, wait five seconds, and then turn on the printer) to have the changes you made take effect.*

Verifying Printer Communications With Your System

Once you have the printer connected to your system, you need to test for communications with your system.

- If you have connected the printer to a PC serial port, the easiest way to test communications is to run PrintSet and then print a test label. You can also send a character string to the printer from DOS.
- If you have connected the printer to a PC parallel port, you can send a character string to the printer from DOS.
- If you are using a different platform to communicate with your printer, please refer to your system user's manual and Chapter 6, "Intermec Printer Language Commands," in this manual for information on downloading commands to the printer.

To verify printer communications using DOS

1. Start with the printer display showing OFFLINE READY. You may need to press On line / Off line to see this display.

2. Press and release the menu panel access door to open the door. From the menu panel, press Menu and then press ↑ or ↓ until you reach the Service menu.

3. Press Select and then press ↑ or ↓ until the display shows:

   ```
   SERVICE MENU
   DATA LINE PRINT
   ```

4. Press Select and then press ↑ or ↓ until the display shows:

   ```
   DATA LINE PRINT
       ENABLED
   ```

5. Press Enter to enable Data Line Print mode. The printer is ready to print characters received from the host.

6. Depending on the PC port the printer is connected to, type the following commands from the DOS prompt and press **Enter** after each line:

Serial Port	Parallel Port
`MODE COM1: 96,E,7,1`	`COPY CON LPT1`
`COPY CON COM1`	`ABCDEF^Z`
`ABCDEF^Z`	

where:

`MODE COM1:`	configures the PC serial port, COM1, for the communication values you specify. For example, 96,E,7,1 configures the PC serial port for 9600 baud, even parity, 7 data bits, and one stop bit. ***Note:*** *The values you specify must match the values of the printer serial port.*
`COPY CON COM1` `COPY CON LPT1`	copies anything you type after this command to COM1 or to LPT1.
`ABCDEF`	random characters typed at the host.
`^Z` (**Ctrl-Z**)	stops the COPY CON command and sends the information to the printer.

The printer prints each character it receives and the hexadecimal value for that character.

7. Press Cont on the printer menu panel to return to the OFFLINE READY display. Data Line Print mode is automatically disabled when you exit the Service menu.

If this test does not work, check to make sure that the communication settings of the PC serial port match the settings of the printer serial port and that the printer cable is securely plugged into the serial or parallel port on the PC and the printer.

2

Operating and Configuring the Printer

This chapter explains how to use the control and menu panels to operate your printer. It also contains information on how to change the printer configuration settings and how you can add options to your printer to enhance printer operation.

Using the Control Panel

You can operate many features of the printer directly from the control panel instead of through a host computer. The control panel provides direct communications with the printer for tasks such as advancing media or canceling the current print job.

Reading the Display

Operating messages These messages appear during normal operation of the printer. The example below is an operating message that indicates the printer is online and ready to print labels:

```
ONLINE
READY
```

Menu messages When you change printing adjustments, messages appear indicating the selections that are active and the task you are performing. For example, when you are adjusting the darkness of your labels, a message similar to the one shown below appears:

```
DARK ADJUST
5*
```

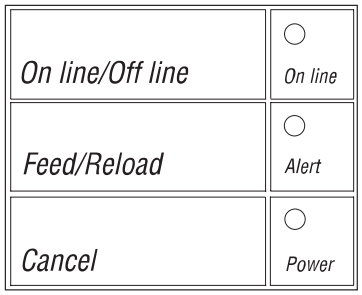
An asterisk (*) appears next to the current setting.

Error messages Error messages indicate a problem with the printer or the data from the host. The message below indicates the supply of thermal transfer ribbon is depleted or jammed:

```
RIBBON FAULT
```

Using the Control Panel Keys

The three control panel keys perform the following functions:



4630U-08

On line/Off line Toggles the printer between online and offline. When online, the printer prints any data it receives. When offline, the printer stops printing and cannot accept data (but can accept protocol commands) from the host computer. For most menu panel operations, the printer must be offline.

Feed/Reload When the printer is offline, you can use this key to advance the media. Pressing this key once advances media to the next print point. Pressing this key twice feeds an entire label through the printer.

Cancel Press this key to delete the current print job after the current label has finished printing. The printer starts the next print job immediately.

Understanding the Indicator Lights

The control panel has three lights that indicate the current operating status of the printer.

On line This light indicates the printer is online (it can receive data from the host computer). When the printer is online, you can only access Operator menu commands.

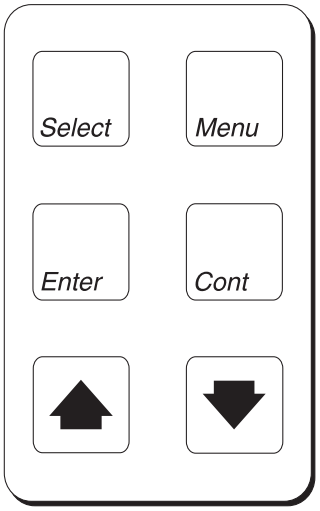
Alert This light flashes for conditions that require your attention, such as an open paper path. A message describing the alert condition also appears on the control panel display.

Power This light remains on as long as the printer is turned on and is receiving power.

Using the Menu Panel

The menu panel is located below the control panel and behind the menu panel access door. Press and release the access door to open it.

You use the menu panel keys to change printer parameters and to setup security levels.



4630U-09

Select Selects menus and features, and returns to the last adjustment display after you have left the menus. This key also selects digits when changing numerical parameters.

Enter Activates a selected option and starts a selected Test or Service function.

Menu Returns to the menu list.

Cont Exits the menus.

↑ and ↓ Scrolls through menus and commands and increases or decreases command settings.

About the Printer Menus

The printer has four menus. The following table will help you to locate the menu you want to use, based on the tasks you are performing with the printer.

Menu	Description	User
Operator	Used for making fine adjustments to the darkness, print alignment, and cutoff point of your labels. This menu can be accessed when the printer is online or offline.	Operators using the printer daily.
Install	Select communication parameters and security levels and install printer options. The printer must be offline to access this menu.	Programmers, systems analysts, or other personnel who install and set up the printer
Service	Set and adjust operating features, calibrate printer sensors, and test current settings. The printer must be offline to access this menu.	Technicians or other personnel qualified to do repair and service.
Configuration	Change the operating parameters and activate or disable optional features. The printer must be offline to access this menu.	Programmers, systems analysts, or supervisors who program and set up printer commands and label formats.

Operator and Install Menus

Default values are indicated by an asterisk (*).

OPERATOR MENU	DARK ADJUST	-10 to 10, 0*	
	X FORMS ADJUST	-30 to 30, 0*	
	Y FORMS ADJUST	-30 to 30, 0*	
	LABEL REST POINT	-30 to 30, 0*	
INSTALL MENU	MAIN PORT	BAUD RATE	19200 9600* 4800 2400 1200 600 300 110
		DATA BITS	7* 8
		MESSAGE LENGTH	255* 512
		PARITY	ODD EVEN* MARK SPACE OFF
		STOP BITS	1* 2
		PROTOCOL	STANDARD* XON/XOFF XONXOFF NO STAT MULTIDROP POLLING MODE D COAX/TWINAX
		DEVICE ADDRESS	A* to Z, 0 to 5
	ALT PORT	Same selections as MAIN PORT.	
	MAX PRINT SPEED	2.0 to 8.0* INCH/SECOND (51 to 203* mm/SECOND) **4630** 2.0 to 5.0* INCH/SECOND (51 to 127* mm/SECOND) **4830**	
	SECURITY	LEVEL 0* LEVEL 3 LEVEL 2 LEVEL 1	

Service Menu

Default values are indicated by an asterisk (*).

SERVICE MENU	SENSOR OUTPUT	GAP	PRINT DISPLAY		
		MARK	PRINT DISPLAY		
		LABEL TAKEN	PRINT DISPLAY		
		PRINT PATH OPEN			
		PRINTHEAD TEMP	PRINT DISPLAY		
	PRINTHEAD	DOTS PASSED	PRINT DISPLAY		
		DOTS FAILED	PRINT DISPLAY		
	MOTOR TEST	MAIN DRIVE	DISABLED* ENABLED		
	MEMORY RESET	COMMAND TABLES CONFIGURATION FONTS/GRAPHICS PAGES/FORMATS ALL			
	PRINT PAGE	ALL 0 THRU 9	PAGE QUANTITY (1-99)	EXECUTE TEST	
	PRINT FORMATS	ALL 0 THRU 19	FORMAT QUANTITY (1-99)	EXECUTE TEST	
	PRINT FONTS	ALL 41-30, 28, 26, 25, 24, 23, 22, 21, 20, 7, 3, 2, 1, 0	EXECUTE TEST		
	PRINT GRAPHICS	ALL 0 THRU 99	EXECUTE TEST		
	PRINT CONFIG	USER DEFINED HARDWARE	EXECUTE TEST		
	PRINT TEST LABEL	PRINT QUALITY PITCH	EXECUTE TEST		
	DATA LINE PRINT	ENABLED DISABLED			
	CLONING	SENDER RECEIVER	EXECUTE TEST		
	SELECTIVE TRANS	SEND ALL	EXECUTE TEST		
		SEND PAGE	0 to 9 ALL	TO PAGE 1-9 EXECUTE TEST	EXECUTE TEST
		SEND FORMAT	0 to 19 ALL	TO FORMAT 1-19 EXECUTE TEST	EXECUTE TEST
		SEND FONT	0 to 25 ALL	TO FONT 3-19 EXECUTE TEST	EXECUTE TEST
		SEND GRAPHIC	0 to 99 ALL	TO GRAPHIC 0-99 EXECUTE TEST	EXECUTE TEST

Configuration Menu

Default values are indicated by an asterisk (*).

CONFIGURATION MENU	LABEL	PRINT SPEED	2.0 to 8.0 INCH/SECOND (51 to 203 mm/SECOND), 3.5 INCH/SECOND* (89 mm/SECOND) **4630** 2.0 to 5.0 INCH/SECOND (51 to 127 mm/SECOND), 2.5 INCH/SECOND* (64 mm/SECOND) **4830**	
		MAX LABEL LENGTH	1 to 24 INCHES (25 to 610 mm), 5 INCHES* (125mm)	
		LABEL WIDTH	2.0 to 6.7 INCHES (51 to 170 mm), 6.55 INCHES* (166 mm) **4630** 3.0 to 9.0 INCHES (76 to 229 mm), 8.85 INCHES* (225 mm) **4830**	
		LABEL STOCK	CONTINUOUS LABEL GAP* LABEL MARK	
		MEDIA TYPE	THERMAL TRANS DIRECT THERMAL*	
	BASIC	CHARACTER SET	US ASCII* UK ASCII GERMAN FRENCH NORWAY/DENMARK SWEDEN/FINLAND SPANISH ITALIAN 256 CHARACTERS CODE PAGE 850 SWITZERLAND	
		TRANSLATION	DISABLED* ENABLED	
		POWER-ON	ONLINE* OFFLINE	
		ASCII ZERO	NOT SLASHED* SLASHED	
		UNITS	INCHES* MILLIMETERS	
		LABEL RETRACT	DISABLED* ENABLED	
		SELF-STRIP	DISABLED* ENABLED	
		CUTTER	DISABLED* ENABLED	
	MEDIA ALERT	MEDIA LENGTH	0* to 99999 INCHES (0 to 2539975 mm)	
		LOW MEDIA WARN	0* to 999 INCHES (0 to 25375 mm)	
		SET WARNING	DISABLED* ENABLED	

Tips for Using the Control and Menu Panels

- To stop printing immediately, without losing data, press: On line / Off line.
- To determine the configuration of the printer, print a configuration test label.
- To access the last adjustment that was made using the menu panel, press Select at the ONLINE READY or the OFFLINE READY display.
- To access the menu where the last adjustment was made, press Menu at the ONLINE READY or the OFFLINE READY display.
- To return to the previous menu, press Menu from within a menu.
- To go directly to the ONLINE READY display after you finish making an offline adjustment, press On line / Off line.

Setting Security Levels

To restrict access to certain printer menus, you can set a security level. Restricting access to printer menus prevents unauthorized tampering with printer settings and eliminates the number of choices you need to scroll through when selecting menus and options.

This table shows the restrictions of the different security levels.

Security Setting	Restrictions
Level 0	None.
Level 1	Operator and Configuration menus.
Level 2	Operator menu.
Level 3	All menus.

To set the security level

1. From the OFFLINE READY display, press Menu and then press ↑ or ↓ until you reach the Install menu.
2. Press Select and then press ↑ or ↓ until the display shows:

```
INSTALL MENU
  SECURITY
```

3. Press Select and then press ↑ or ↓ to access the security level you want.

4. Press Enter to activate the security level setting.

5. Press Cont to return to the OFFLINE READY display.

To bypass a security level

1. Turn off the printer.
2. Press and hold the Feed / Reload key and turn on the printer.

The printer security level is set to 0, which allows access to all menus

Setting the Dark Adjust

Print darkness can be adjusted when the printer is online or offline. The dark adjust setting is set at the factory for common media.

A darkness setting of zero should provide optimal print quality; however, in order to maintain print quality, you may need to adjust print darkness under the following conditions:

- Change in print speed.
- Change in media type (from direct thermal to thermal transfer and vice versa).
- Printhead wear.
- Using large amounts of media.

To adjust the darkness of your labels

1. From the ONLINE READY display, press Menu to enter the Operator menu.
2. Press ↑ or ↓ until the display shows:

   ```
   OPERATOR MENU
   DARK ADJUST
   ```

3. Press Select. The display shows the current darkness setting.
4. Press ↑ to increase the printing darkness or press ↓ to lighten the printing on the label. The range is from -10 (lightest) to 10 (darkest).
5. Press Enter to activate the new setting.
6. Press Cont to return to the ONLINE READY display.
7. Print several print quality labels and then scan the bar codes on the labels. You want to get a very high successful scan percentage (95% or better) when you scan these labels. You can also use a bar code verifier to determine if the print quality is acceptable for your application.

8. If the labels are too dark or too light, repeat this procedure until you get the results you want.

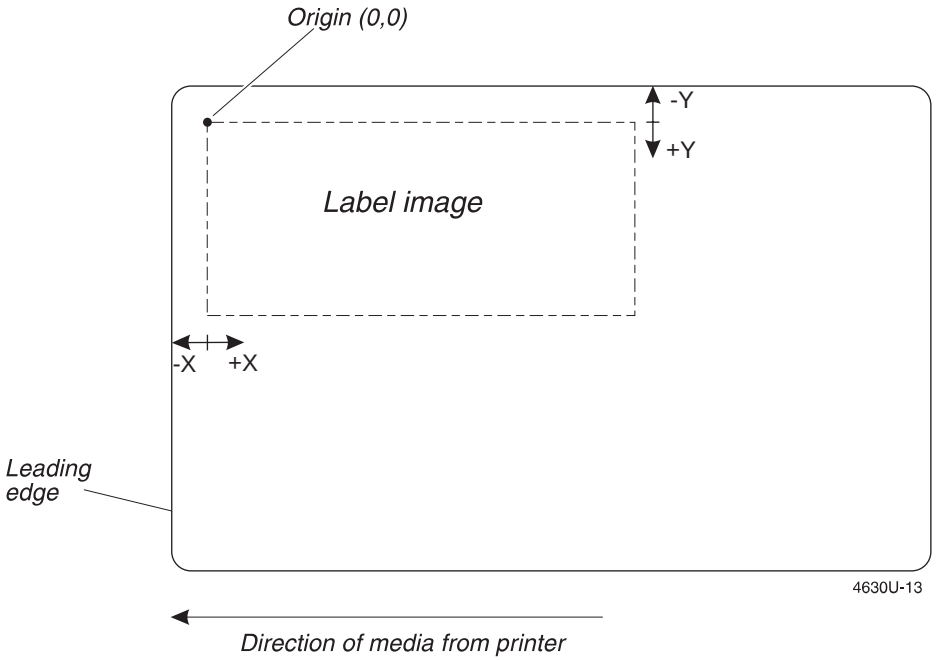
   Note: *The human eye generally likes darker print than what is required for a good scan.*

Using the X and Y Forms Adjust

If the print on your labels is not positioned correctly, you can center the printed image with the X and Y Forms Adjust commands. The X Forms Adjust lets you adjust the position of the printed image in the direction of media movement (moves the print further towards the front or back of the label). The Y Forms Adjust lets you adjust the position of the print in the direction parallel to the front of the printhead (moves the print towards the sides of the label). You can use X and Y Forms Adjust commands when the printer is online or offline.

You can adjust the print alignment on your labels without interrupting normal label production. The following example uses the X Forms Adjust command. The procedure is performed similarly for the Y Forms Adjust command.

Note*: The x-dimension is also affected by the Top-of-Form configuration command. For more information, see "Top of Form, Set" in Chapter 6.*



To adjust the print alignment

1. From the ONLINE READY display, press Menu to enter the Operator menu.
2. Press ↑ or ↓ until the display shows:

   ```
   OPERATOR MENU
   X FORMS ADJUST
   ```

3. Press Select. The display shows the current X Forms Adjust command setting.
4. Press ↑ to increase the number and move the print towards the back of the label. Press ↓ to decrease the number and move the print towards the front of the label.

   Note: *The range of the X Forms Adjust command is from -30 (furthest forward on the label) to +30 (furthest backward on the label). The range for the Y Forms Adjust command is from -30 (closest to the top of the label) to +30 (closest to the bottom of the label).*

5. Press Enter at the setting you want.
6. Press Cont to return to the ONLINE READY display.
7. Print several labels. If the print is not positioned properly, repeat this procedure until you get the results you want.

Adjusting the Label Rest Point

The Label Rest Point command sets the point where labels are presented for cutting or removal from the printer. This command is primarily used with the self-strip and cutter options. Adjust the label rest point setting, if you are loosing part of a label each time one is cut or removed from the printer.

To adjust the label rest point

1. From the ONLINE READY display, press Menu to enter the Operator menu.
2. Press ↑ or ↓ until the display shows:

   ```
   OPERATOR MENU
   LABEL REST POINT
   ```

3. Press Select. The display shows the current setting for the Label Rest Point command.

4. Press ↑ so that labels move farther forward from the front of the printer. Press ↓ so that labels do not move as far forward from the front of the printer.

   ***Note**: The range for the label rest point is from -30 to +30 in 5 mil increments.*

5. Press Enter at the setting you want.
6. Press Cont to return to the ONLINE READY display.
7. Print several labels. If the labels do not stop at the right point for removal or cutting, repeat this procedure until you get the results you want.

Printing the Buffer Contents

You can print the data that is stored in the printer buffer when the printer is offline.

To print the buffer contents

1. Take the printer offline.
2. Press Cont. The printer prints the contents of the buffer.

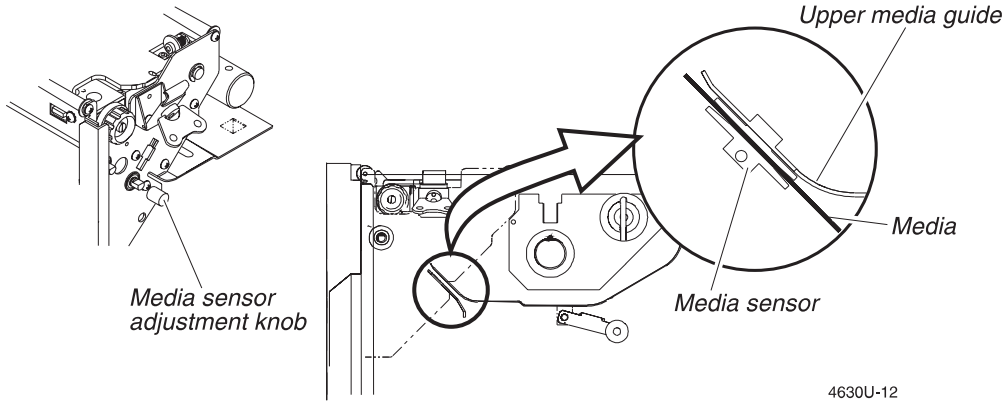
   The printer cannot receive data when it is offline, so the printer can only print what is in the buffer. When printing stops, the buffer is empty.

Adjusting the Media Sensor

The media sensor performs two functions: it monitors the position of a label along the media path and it monitors when the label stock must be replaced. The printer firmware interprets the media sensor input to determine the top of form position on a label or an out of stock condition with the printer.

The media sensor is adjustable across half of the media path. In general, if the media sensor adjustment knob is kept in the full counterclockwise position, it will correctly sense all widths of media. However, if a problem occurs with sensing the label top of form, try rotating the media sensor adjustment knob clockwise, one half turn at a time, until the error is eliminated.

Adjusting the Media Sensor



Adjusting the Printer for Different Width Media

The printhead has a leveling cam adjustment to ensure even print quality across the media regardless of the media dimension. The cam adjustment raises or lowers the right side of the printhead to keep it level across the media.

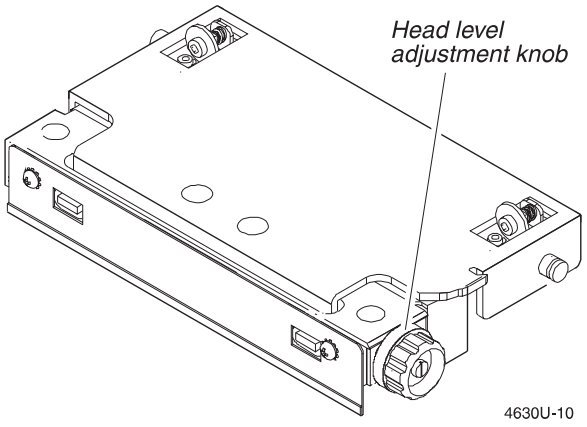
Your printer is set up at the factory for the following media:

4630 Standard 4 mil thick, 6.55 inch (166 mm) wide print media.

4830 Standard 4 mil thick, 8.85 inch (225 mm) wide print media.

The cam adjustment is designed to compensate for the use of narrower width stock. When the cam is out of adjustment, print along one side of the label will drop off suddenly, rather than gradually fading out.

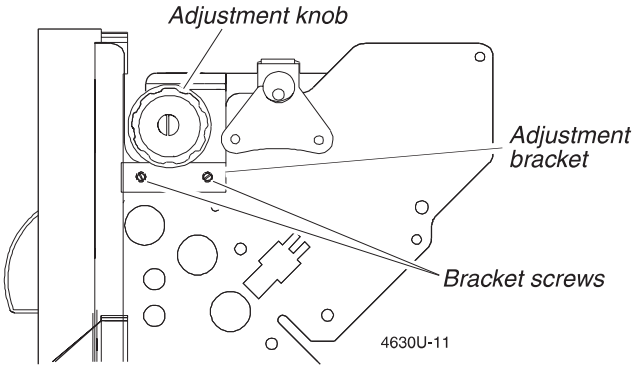
You must pull out on the adjustment knob to turn it. The knob has numbers that you can use as reference points when adjusting media width; however, the numbers do not relate to specific media sizes. Turn the knob one or two numbers at a time until the desired print quality is achieved.



When changing to media that has a different thickness, it may also be necessary to reset the cam adjustment bracket.

To reset the cam adjustment bracket

1. Pull out on the adjustment knob and turn it counterclockwise until it stops.
2. Loosen the two screws securing the bracket.
3. Load the new media.
4. Slide the bracket up or down to contact the cam adjustment.
5. Tighten the two screws to secure the bracket.
6. Print a test label. You may need to turn the cam adjustment knob to fine tune the print quality.



Removing Thermal Transfer Ribbon

Generally, ribbons are completely used before they are replaced. To remove a completely used ribbon, pull the ribbon straight off the take-up hub. However, if you need to print in direct thermal mode before the thermal transfer ribbon has been completely used, you must remove the used portion of the ribbon.

To remove partially used thermal transfer ribbon

1. Cut the ribbon between the idler rollers.
2. Turn the ribbon supply hub to rewind the unused ribbon until it is clear of the printhead. Leave the good ribbon on the supply hub until you need to use it again.
3. Turn the ribbon take-up hub counterclockwise to roll up the used ribbon, and then slide the ribbon off the take-up hub.

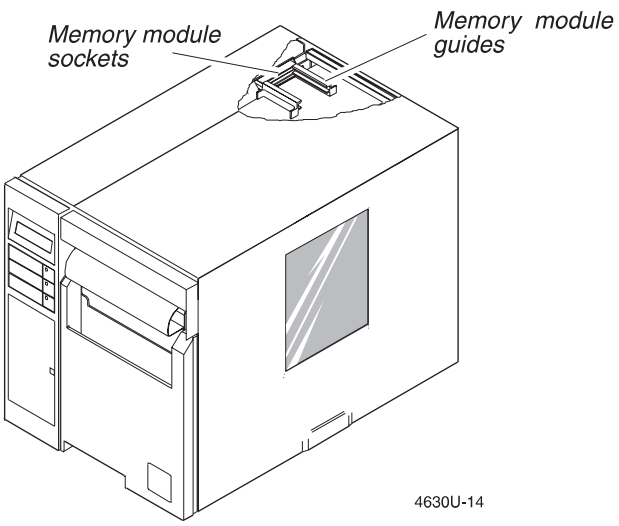
Adding Additional Memory

The printer can use memory modules to provide extra storage capacity for fonts and graphics. You can use one or two, 1MB or 4MB modules to expand printer storage memory up to an additional 8MB. The memory module slots are accessed from the stock door side of the printer.

You load data into a module by downloading printer commands or by using printer application software, such as PrintSet.

To install a memory module

1. Turn off the printer and raise the stock door. The printer has an upper and a lower module slot. You can use one or both of the slots.
2. With the module cartridge label facing up, carefully seat the cartridge firmly into one of the module slots. Be careful not to bend the pins of the connector. The printer senses the storage memory module once it is installed.



Note: *You cannot move storage memory modules from printer to printer without reloading the module contents.*

Increasing Image Memory

The 4630 and 4830 printers come with 1MB of image memory. You can add 4MB or 16MB of image memory to the printer in order to print longer labels.

The following table shows the maximum length of the labels you can print based on the amount of image memory in your printer.

	Maximum Label Length	
Image Memory	**4630**	**4830**
Standard (1MB)	8 in. (20 cm)	6 in. (15 cm)
5MB	50 in. (127 cm)	35 in. (89 cm)
17MB	200 in. (508 cm)	150 in. (381 cm)

Using the Media Rewind Hub

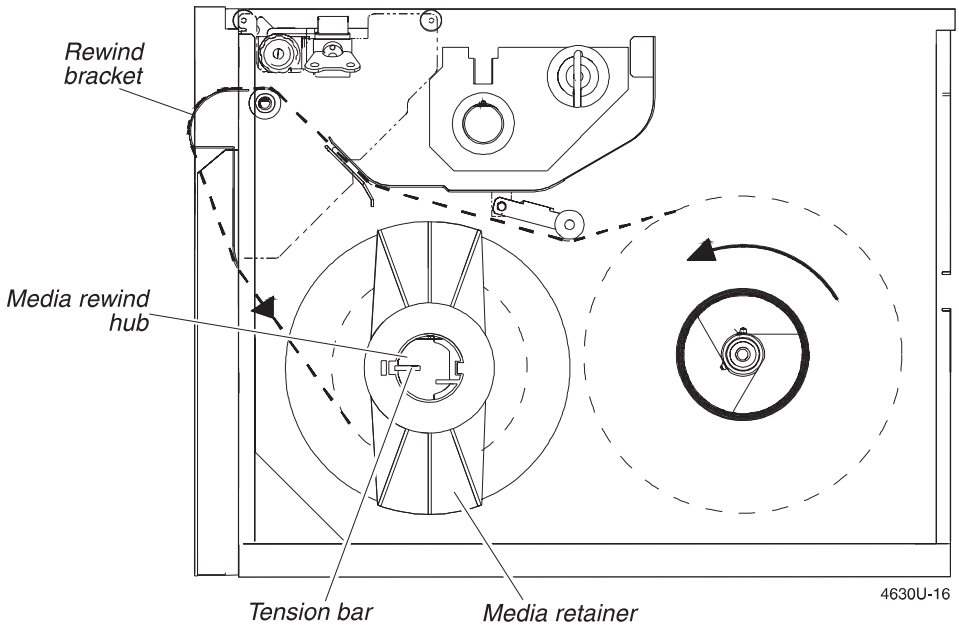
The media rewind hub is an option that you can purchase with your printer to spool printed label media. This option is necessary if you need to print large quantities of labels as a single batch or that you want to use at a later time. The rewind hub is also necessary if you want to use the self-strip option.

To use the media rewind hub

1. Open the stock door.
2. Load your label media and feed it through the printer until approximately 18 inches (46 cm) of media extend from the front of the printer.
3. Route the media around the rewind bracket and insert it through the media take-up slot.
4. If necessary, loosen the thumbscrew on the media retainer and remove the retainer from the media rewind hub.
5. Pull on the rewind hub tension bar in order to slide the core adapters onto the rewind hub. Adjust the core adapters to the size of your media core and then use the thumbscrews to tighten them to the hub.
6. Slide an empty media core onto the media rewind hub and wrap the media around the core by turning the hub counterclockwise several turns.

   Note: *You may rewind media directly on the rewind hub; however, for best results, Intermec recommends using a media core.*

7. Slide the media retainer onto the rewind hub so it's just touching the media core and tighten the thumbscrew.
8. Close the stock door.



To remove media or media backing from the rewind hub

1. Open the stock door.
2. Loosen the thumb screw on the media retainer and remove it.
3. Pull the media and core off of the rewind hub.

   Note: *If you have wound media or media backing directly on the rewind hub, pull on the rewind hub tension bar. This will release the tension on the media so you can remove the media from the hub.*

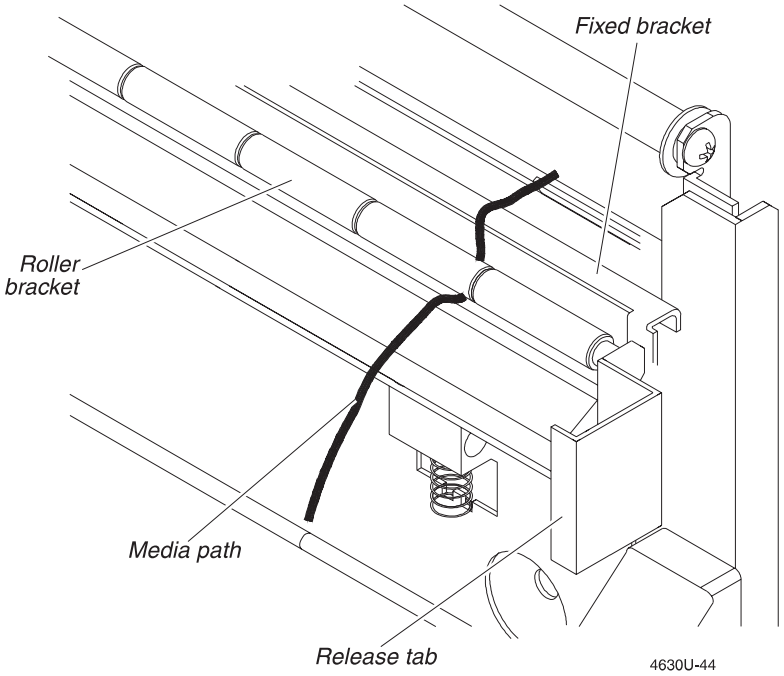
Using the Self-Strip Assembly

You can order the printer with the self-strip assembly option or you can purchase this option separately and have it installed by an Intermec service technician. You must have the media rewind hub option on your printer in order to use the self-strip assembly.

The label taken sensor is part of the self-strip assembly and it prevents the printer from printing a new label until the last printed label has been removed from the printer.

To route media through the self-strip assembly

1. Load the printer with die-cut media and feed it through the printer until approximately 18 inches (46 mm) of media extend from the front of the printer.
2. Pull open the roller bracket using the two release tabs and then thread the media over the top of the fixed bracket, under the rollers of the roller bracket, and into the media take-up slot.



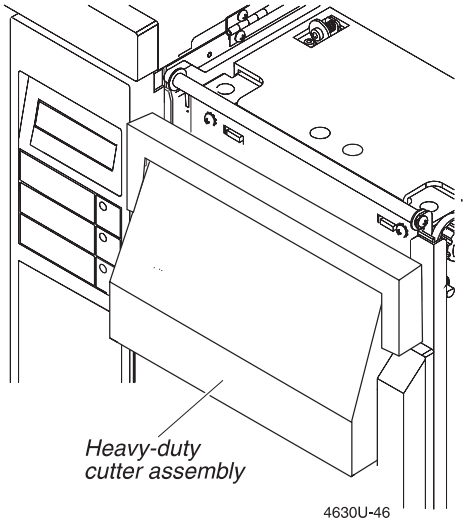
3. Connect the media to the media rewind hub. Refer to “Using the Media Rewind Hub” earlier in this chapter for more information.

Using the Cutter

You can order the heavy-duty cutter option for the 4630 and 4830 printers or you can purchase the standard cutter option that is only available for the 4630 printer. The heavy-duty cutter is designed to cut adhesive-backed media and tag media whereas the 4630 standard cutters should only cut media backing.

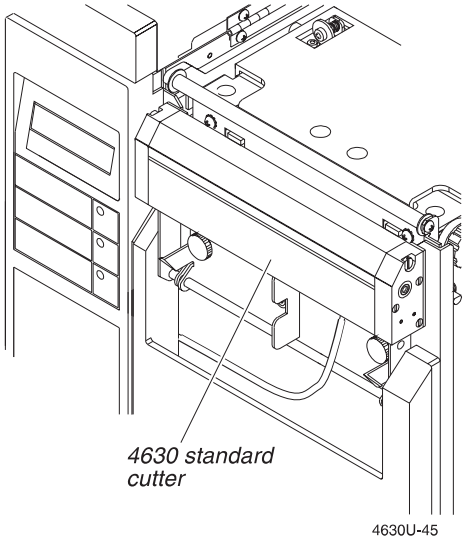
Routing Media Through the Heavy-Duty Cutter

1. Turn off the printer and then open the stock door.
2. Load the printer with media and route the media through the printer until about 10 inches (25 cm) of media extent from the front of the printer.
3. Open the heavy-duty cutter assembly and feed the media through the cutter media guides.
4. Close the heavy-duty cutter assembly.



Routing Media Through the 4630 Standard Cutter

1. Turn off the printer.
2. Turn the cutter latch counterclockwise to unlock the cutter assembly and pull it forward.
3. Load the printer with media and route it through the printer, until about 10 inches (25 cm) of media extent from the front of the printer.
4. Feed the media through the media slot on the back of the cutter assembly and out the front of the cutter assembly.
5. Push the cutter assembly flush against the printer and rotate the cutter latch clockwise to lock it into place.



Enabling the Cutter

1. From the OFFLINE READY display, press Menu and then press ↑ or ↓ until you reach the Configuration menu.
2. Press Select and then press ↑ or ↓ until the display shows:

```
CONFIGURATION
    BASIC
```

3. Press Select and then press ↑ or ↓ until the display shows:

```
CONFIGURATION
    CUTTER
```

4. Press Select and then press ↑ or ↓ until the display shows:

```
    CUTTER
   ENABLED
```

5. Press Enter to activate the cutter and then press Cont to return to the OFFLINE READY display.

Testing Cutter Operation

1. From the OFFLINE READY display, press Menu and then press ↑ or ↓ until you reach the Service menu.
2. Press Select and then press ↑ or ↓ until the display shows:

```
  SERVICE MENU
PRINT TEST LABEL
```

3. Press Select and then press ↑ or ↓ until the display shows:

```
  SERVICE MENU
 PRINT QUALITY
```

4. Press Select. The display shows:

```
 PRINT QUALITY
 EXECUTE TEST
```

5. Press Enter to print the quality test label.

The cutter cuts the label. After the label is cut, the printer retracts the media for printing the next label.

Note: *You may need to adjust the Label Rest Point setting on the Operator Menu if you notice that the new label is not printing in the correct location after the previous label has been cut. The range for the label rest point is from -30 to +30 in 5 mil increments.*

Changing Printer Configuration Settings

The factory default configuration of the printer works well in most operating environments; however, you can easily change these settings to meet your specific operational needs.

The following table shows the basic configuration settings of the printer. An asterisk (*) indicates the default values.

Command	Settings	Description
Character Set	US ASCII*, UK ASCII, German, French, Norway / Denmark, Sweden / Finland, Spanish, Italian, 256 Characters, Code Page 850, Switzerland	Select the character set you want to use. ***Note:*** *If you want to use Code Page 850 or 256 Characters, you must configure the printer for 8 bits per byte data transmission*.
Translation	Enabled, Disabled*	The IBM Translation command allows IBM compatible characters to replace standard ASCII characters based on the current character set.
Power-On	Online*, Offline	Controls if the printer is online or offline when the printer is turned on.
ASCII Zero	Slashed, Not Slashed*	Controls how zeros are printed: with or without a slash.
Units	Inches*, Millimeters	Use English or metric printer measurements.
Label Retract	Enabled, Disabled*	The Label Retract command enables the printer to retract label at the start of print to prevent skipped labels. Press Feed / Reload after changing this setting.
Self-Strip	Enabled, Disabled*	An external option that automatically removes the backing from a label. Press Feed / Reload after changing this setting.
Cutter	Enabled, Disabled*	An external option that cuts labels from the media roll after the labels are printed. Press Feed / Reload after changing this setting.

To change the printer configuration

1. From the OFFLINE READY display, press Menu and then press ↑ or ↓ until you reach the Configuration menu.
2. Press Select and then press ↑ or ↓ until the display shows:

   ```
   CONFIGURATION
     BASIC
   ```

3. Press Select and then press ↑ or ↓ to scroll through the available commands.
4. Press Select when you reach the command you want. The display shows the current setting for the command.
5. Press ↑ or ↓ to scroll through the available settings for that command.
6. Press Enter when you see the setting you want. An asterisk (*) appears next to the new setting, indicating it is active.
7. Press Cont to return to the OFFLINE READY display or, to change other configuration settings, press Menu and repeat Steps 3 through 6.

Changing the Label Configuration Settings

To obtain the best print quality, you must adapt your printer to print at the desired print speed on the type of media (label stock) you are using. Your Intermec representative can recommend media types for your system.

The following table shows the label configuration settings of the printer. An asterisk (*) indicates the default values.

Command	Settings	Description
Print Speed	2.0, 2.5* (4830), 3.0, 3.5* (4630), 4.0, 4.5, 5.0, 5.5, 6.0, 6.5, 7.0, 7.5, 8.0 in / sec (51, 64* (4830), 76, 90* (4630), 104, 117, 132, 142, 153, 165, 180, 198, 203 mm / sec)	The rate at which labels are printed. ***Note:*** *The 4830 printer has a maximum print speed of 5 ips (132 mm/sec).*
Max Label Length	1 to 24 in (25 mm to 600 mm)— default is 5 in (125 mm)	The maximum amount of label stock the printer advances before it checks for a low stock condition.
Label Stock	Continuous, Label Gap*, Label Mark	The type of label stock you are using. Press Feed/Reload after changing this setting.
Media Type	Direct Thermal*, Thermal Transfer	The type of media you are using. Press Feed/Reload after changing this setting.

To change the label configuration settings

1. From the OFFLINE READY display, press Menu and then press ↑ or ↓ until you reach the Configuration menu.
2. Press Select and then press ↑ or ↓ until the display shows:

   ```
   CONFIGURATION
       LABEL
   ```

3. Press Select and then press ↑ or ↓to scroll through the available commands.
4. Press Select when you reach the command you want. The display shows the current setting for the command.
5. Press ↑ or ↓ to scroll through the available settings for that command.
6. Press Enter when you see the setting you want. An asterisk (*) appears next to the new setting, indicating it is active.
7. Press Cont to return to the OFFLINE READY display or, to change other configuration settings, press Menu and repeat Steps 3 through 6.

Setting the Media Alert

The Media Alert feature flashes the Alert light to warn you when the media supply is getting low.

Note: *You need to reset the Media Length and the Low Media Warn commands each time you load a different size roll of media into the printer. If you do not, the printer may not give you sufficient warning of a low media condition.*

To use Media Alert, you must set three control panel commands. An asterisk (*) indicates the default values.

Command	Settings	Description
Media Length	0* to 99999 inches or 0* to 2539975 mm	The media supply length in inches or millimeters. The printer uses this value to count backwards (down) to the low media warning point.
Low Media Warn	0* to 999 inches or 0* to 25375 mm	The minimum amount of media supply. When the media supply reaches this amount, the alert light is activated.
Set Warning	Enabled, Disabled*	Enable or disable the Media Alert feature.

To set the media length

1. From the OFFLINE READY display, press Menu and then press ↑ or ↓ until you reach the Configuration menu.
2. Press Select and then press ↑ or ↓ until the display shows:

```
CONFIGURATION
 MEDIA ALERT
```

3. Press Select and then press ↑ or ↓ until the display shows:

```
 MEDIA ALERT
MEDIA LENGTH
```

4. Press Select. The display shows the current setting with a cursor under the first digit, for example:

```
 MEDIA LENGTH
06000 INCHES*
```

5. Press ↑ to increase the digit or press ↓ to decrease the digit. Press Select to move the cursor to the next digit.

   Note: *Pressing* Select *at the last digit moves the cursor to the first digit.*

6. Press Enter when you have the media length you want.
7. Press Cont to return to the OFFLINE READY display.

To set the low media warning

1. From the OFFLINE READY display, press Menu and then press ↑ or ↓ until you reach the Configuration menu.
2. Press Select and then press ↑ or ↓ until the display shows:

```
CONFIGURATION
 MEDIA ALERT
```

3. Press Select and then press ↑ or ↓ until the display shows:

```
 MEDIA ALERT
LOW MEDIA WARN
```

4. Press Select. The display shows the current setting for the Low Media Warn command with the cursor under the first digit.
5. Press ↑ to increase the digit or press ↓ to decrease the digit. Press Select to move the cursor to the next digit.
6. Press Enter when you have the value you want.
7. Press Menu and then press ↑ or ↓ until the display shows:

```
 MEDIA ALERT
 SET WARNING
```

8. Press Select and then press ↑ or ↓ until the display shows:

```
SET WARNING
  ENABLED
```

9. Press Enter to enable the Low Media Warn command and then press Cont to return to the OFFLINE READY display.

Printing Configuration Test Labels

To review the current configuration of the printer, you can print a Configuration Test Label that shows either the user-defined software or hardware configuration of your printer.

User-Defined This label lists the current configuration parameters that are set from the Configuration, Operator, and Install menus, as well as defined pages, formats, graphics, and fonts. Any printer options that you have installed are also listed on this label.

Hardware This label lists the amount of memory installed in your printer (static and dynamic RAM), the width and dot size of the printhead, and the printhead mileage. The printhead mileage consists of both the amount of media that has been processed (passed underneath the printhead) and the amount of media that has been burned (printed).

To print a Configuration Test Label

1. From the OFFLINE READY display, press Menu and then press ↑ or ↓ until you reach the Service menu.
2. Press Select and then press ↑ or ↓ until the display shows:

```
SERVICE MENU
PRINT CONFIG
```

3. Press Select and then press ↑ or ↓ to reach the label you want: User-Defined or Hardware.
4. Press Select and then press Enter to print a Configuration Test Label.

Restoring the Printer Default Configuration

1. From the OFFLINE READY display, press Menu and then press ↑ or ↓ until you reach the Service menu.
2. Press Select and then press ↑ or ↓ until the display shows:

   ```
   SERVICE MENU
   MEMORY RESET
   ```

3. Press Select and then press ↑ or ↓ until the display shows:

   ```
   MEMORY RESET
   CONFIGURATION
   ```

4. Press Enter to reset the configuration settings.

***Note**: After using the Memory Reset command, you must enable any options you want to use, such as self-strip or the cutter.*

The Memory Reset command restores the following factory default settings in the printer:

Parameter	Setting	Parameter	Setting
ASCII Zero	Not Slashed	Media Length	0
Baud Rate	9600	Media Type	Direct Thermal
Character Set	US ASCII	Message Length	255
Cutter*	Disabled	Parity	Even
Dark Adjust	0	Power-On	Online
Data Bits	7	Print Speed	3.5 ips (4630) 2.5 ips (4830)
Device Address	A	Protocol	Standard
External Options	None	Security	Level 0
Forms Adjust	0	Self-Strip*	Disabled
Internal Options	None	Set Warning	Disabled
Label Rest Point	0	Stop Bits	1
Label Retract	Enabled	Translation	Disabled
Label Stock	Gap	Units	Inches
Low Media Warn	0	X Forms Adjust	0
Max Label Length	5 inches	Y Forms Adjust	0

* Printer option

3

Maintaining the Printer

Your Intermec printer is designed to withstand harsh environments, but it should be cleaned on a regular basis to keep it running at full capacity.

Inspecting the Printer

Inspect the printer and the rest of your data collection system on a regular basis. Your inspections should include the following:

- Make sure the printer is properly grounded.
- Inspect the work environment. Large electric motors, welders, and switching equipment can affect printer performance.
- Keep the printer away from liquids.
- Check the network regularly for loose wires or poorly installed connections. Be sure to replace corroded wires.

Components to Maintain

Clean your printer regularly to maintain the quality of your labels and extend the life of your printer. To clean the printer effectively and safely, use the following items:

- Isopropyl alcohol
- Cotton swabs
- Lint-free cloth
- Compressed air

Printer Component	Maintenance Period
Printhead	Inspect after every roll of media. Clean after every five rolls of media.
Drive roller, tear bar, media pathway, and edge guides	Clean after every ten rolls of media. If you are using hi-tack adhesive you must clean after every roll of media. If you are using tag stock or continuous media, you should clean after every five rolls of media.
Printer cover	Clean as necessary.
Heavy-duty cutter blades	The maintenance period depends on the media you are cutting: • Media backing—clean after every 150,000 cuts. • Media with adhesive and tag media—clean after every 30,000 cuts. The cutter uses self-sharpening blades that have a life expectancy of 1,000,000 cuts.
Standard cutter blade	Clean after every 100,000 cuts.

Cleaning the Printer

The following procedures tell you how to access the printer components and how to clean them properly.

Note: *Turn off and unplug the printer before cleaning any components.*

Cleaning the Printhead

Cleaning media debris from the printhead maintains close contact between the media and printhead, which provides good print quality. The printhead should be cleaned after every five rolls of media. If a label jams during printing, clean the printhead immediately after you remove the label.

Caution

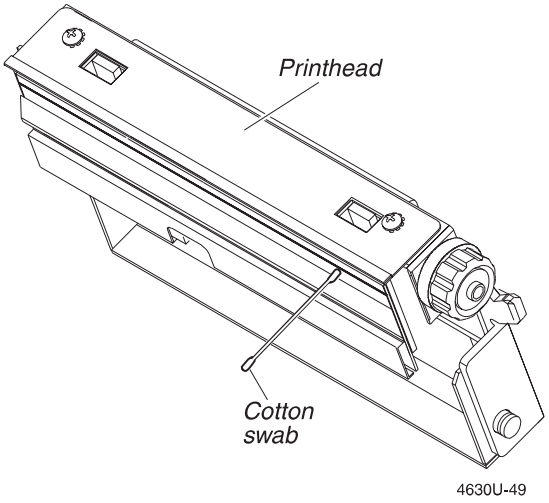
Do not use sharp objects such as knives or screwdrivers to scrape the printhead clean. Cleaning with sharp objects will damage the printhead. Clean with a cotton swab, or a clean, lint-free cloth and isopropyl alcohol.

Conseil

N'utilisez pas d'objets pointus tels que couteaux ou tournevis pour nettoyer la tête d'impression. Nettoyer avec des objets pointus endommagera la tête d'impression. Nettoyez-la 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. Open the stock door.
2. Remove the ribbon if you are printing in thermal transfer mode.
3. Unlock the printhead by rotating the printhead latch wing counterclockwise one-half turn. Lift the printhead to the raised position.
4. Use a cotton swab moistened with isopropyl alcohol to clean the printhead. Be persistent in order to remove any dirt, adhesive, or debris from the print surface on the bottom of the printhead.



5. Wait 5 to 10 seconds for the print surface to dry.
6. Replace the ribbon if you are printing in thermal transfer mode.
7. Lower the printhead, engage the printhead latch, and rotate the printhead latch wing clockwise one-half turn to lock the printhead.
8. Close the stock door when you are finished cleaning the printer.

Cleaning the Drive Roller and the Tear Bar

Cleaning the drive roller and the tear bar preserves print quality by ensuring close contact between the media and the printhead.

To clean the drive roller and the tear bar

1. Open the stock door.
2. Raise the printhead latch wing and rotate it counterclockwise one-half turn to unlock the printhead. Lift the printhead to the raised position.
3. Clean the drive roller with a clean, lint-free cloth moistened with isopropyl alcohol. Make sure to rotate the roller so that you clean the entire surface of the roller.

Caution
Do not scrape the rubber drive roller. Scraping will gouge the roller and void any applicable warranty. Gouged rollers must be replaced to maintain high quality label printing.

Conseil
Ne grattez pas le rouleau caoutchouté. Gratter le rouleau gougera le caoutchouc et annulera toute garantie applicable. Vous devez remplacer les rouleaux gougés pour maintenir une haute qualité d'impression d'étiquettes.

4. Clean the tear bar with a cloth dampened with isopropyl alcohol to remove all traces of dust, paper, and adhesive.

Warning
Use extreme caution when cleaning the tear bar to avoid cutting yourself.

Avertissement
Lors du nettoyage de la barre coupante, prenez bien soin de ne pas vous couper.

5. Lower the printhead, engage the printhead latch, and rotate the latch wing clockwise one-half turn to lock the printhead.
6. Close the stock door when you are finished.

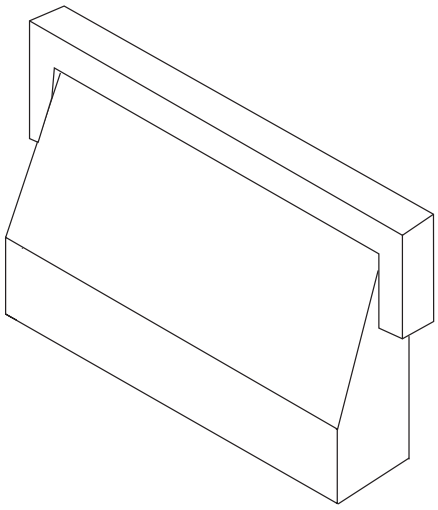
Cleaning the Media Path

You should clean the media path regularly to keep debris off the media surface and printhead where irregularities can spoil print quality or damage the printhead. Cleaning the media guides prevents the media from skewing or improperly tracking as the media travels through the paper path, which can result in smeared images and print off the side of the label. If a label jams during printing, clean the media guides immediately after you remove the label from the printer.

To clean the media guides and bouncer assembly

1. Open the stock door.
2. Clean the upper and lower media guides and the bouncer assembly with a clean, lint-free cloth moistened with isopropyl alcohol. Be sure to remove all traces of debris.
3. Close the stock door when you are finished cleaning the printer.

Cleaning the Heavy-Duty Cutter Assembly


4630U-50

The heavy-duty cutter uses self-sharpening blades that require a minimal amount of maintenance and provide a life expectancy of one million cuts. However, during cutter operation, the cutter blades collect adhesive and produce dust and paper particles. The cutter blades must be cleaned periodically to ensure proper performance of the cutter assembly. Use the following guidelines, based on the media that is cut, to determine a maintenance schedule for the cutter assembly:

- Media backing—clean after every 150,000 cuts.
- Media with adhesive and tag media—clean after every 30,000 cuts.

To clean the cutter assembly

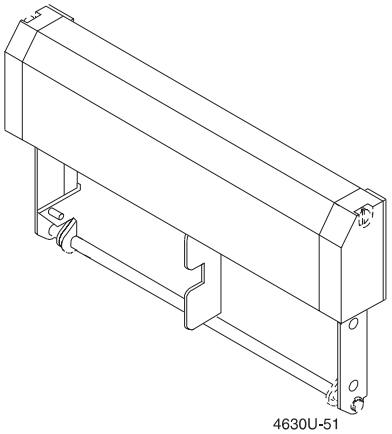
1. Open the cutter assembly, disconnect the cutter power cable, and remove the cutter assembly from the cutter mounting bracket.
2. Remove the Phillips screws from the back of the cutter assembly and then remove the cover.
3. Use a cotton swab moistened with isopropyl alcohol to clean the cutter blades of adhesive buildup.

Warning
Use extreme caution when cleaning the cutter to avoid cutting yourself.

Avertissement
Lors du nettoyage de la barre coupante, prenez bien soin de ne pas vous couper.

4. Use compressed air to remove dust and paper particles from the cutter mechanism.
5. Replace the cutter cover and secure the cover to the cutter assembly.
6. Install the cutter assembly on the cutter mounting bracket, connect the cutter power cable, and then close the cutter assembly.

Cleaning the 4630 Standard Cutter Assembly



The 4630 standard cutter is designed to cut non-adhesive media that does not exceed a thickness of 0.0075" (0.190 mm). The cutter requires a minimal amount of maintenance; however, it produces dust and paper particles as it operates and must be cleaned periodically to ensure proper performance. Clean the cutter of debris buildup after every 100,000 cuts. The cutter assembly has a life expectancy of 500,000 cuts.

To clean the cutter assembly

1. Disconnect the cutter power cable from the bottom of the cutter assembly and then remove the cutter assembly from the printer.
2. Remove the Phillips screw that secures the upper cover to the cutter assembly and then remove the upper cover.
3. Use a cotton swab moistened with isopropyl alcohol to clean the cutter blade of adhesive buildup.

Warning
Use extreme caution when cleaning the cutter to avoid cutting yourself.

Avertissement
Lors du nettoyage de la barre coupante, prenez bien soin de ne pas vous couper.

4. Use compressed air to remove dust and paper particles from the cutter mechanism.
5. Replace the upper cutter cover and secure it to the cutter assembly.
6. Install the cutter assembly on the printer and then connect the cutter power cable to the cutter assembly.

Cleaning the Printer Cover

Clean the printer cover with a general purpose cleaner (soapy water / mild detergent). Do not use abrasive cleansers or solvents. Be sure to clean the transparent panel on the stock door so that the media supply inside the printer is visible when the cover is closed.

4

Troubleshooting

This chapter provides information on troubleshooting error messages that may appear on the printer control panel display, as well as certain problems you may have with your printer.

Troubleshooting Checklist

Even though your printer is designed to operate reliably under harsh conditions, you may still encounter error messages at some time. Most of the errors you encounter can be easily fixed and will not delay operation of the printer for very long.

If you receive an error message or encounter a functional problem with the printer, try the following:

- Check the display for an error message.
- If there is an error message on the display, find it in the table under “Error Messages” in this chapter and follow the instructions.
- If the display does not show an error message, try to locate the symptom in the tables under “Printer Operation Problems” or “Print Quality Problems” later in this chapter and follow the instructions.
- Clean the printer components and check all connections.

If the problem persists, contact:

North America your Intermec Customer Service Representative at 1-800-755-5505.

International your local Intermec representative.

Printer Operation Problems

If your printer is not operating correctly, try locating the problem in the table below: {xe "printer:operating problems"}{xe "troubleshooting:printer operation problems"}

Symptom	Cause	Solution
Labels stop feeding through the printer.	Media is sticking to the paper path.	Clear any extraneous material from the paper path and clean it thoroughly.
	Printer is out of media.	Load new media.
	Label gap or label mark sensors are dirty.	Clean label sensors.
	Label stock is loaded incorrectly.	Check the paper path.
	Label Stock command is not set for your media.	Use the menu panel to change the label stock setting to match the media you are using.
No power or power loss.	AC power cable is damaged or disconnected.	Make sure the power cable is plugged into both the printer and an outlet or power strip. Replace the cable if it is damaged.
	Printer main power fuse is burnt out.	Contact your Intermec representative to have an Intermec service technician replace the fuse.
	The secondary fuse is burnt out.	Contact your Intermec representative to have an Intermec service technician replace the fuse.
Printer slows down.	Print speed incorrectly set (and is not recovered when printer quits).	Use the menu panel to change the print speed settings.
	Printer has quit and print speed was reset.	Use the menu panel to change the print speed settings.

Print Quality Problems

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

Symptom	Cause	Solution
Blotches on labels.	Dirty printhead.	Clean the printhead.
	Dirty paper path.	Clean the paper path.
	Poor quality label or ribbon stock.	Contact your Intermec representative for suggestions on proper media or ribbons for your printing requirements.
Labels are not stopping at the right point to be removed.	Label Rest Point command incorrectly set.	Adjust the Label Rest Point.
Menu panel does not access menus.	Security command set to restrict access to menus.	To bypass security levels, turn off the printer, press and hold Feed/Reload, and then turn on the printer
Print is too far forward or too far back.	Forms Adjust command incorrectly set.	Reset Forms Adjust.
Printing is too light or too dark.	Dark adjust is incorrectly set.	Try changing the Dark Adjust menu panel setting.
	Dirty printhead.	Clean the printhead.
	Poor quality label or ribbon stock.	Contact your Intermec representative for suggestions on proper media or ribbons for your printing requirements.

Communications Problems

If your printer is not receiving downloaded data or you cannot reach a certain menu on the control panel, try the solutions in the following table.

Symptom	Cause	Solution
Printer does not communicate with host.	Printer is offline.	Press On line / Off line on the control panel.
	Main Port or Auxiliary Port commands incorrectly set.	Make sure printer port settings and the host port settings match. You can review the printer port settings by using the menu panel, or print a user-defined configuration test label.
	Damaged or incorrect I / O cable.	Check the connections at both ends or replace the cable. Refer to Chapter 1 and Appendix B.

Error Messages

Most of the problems the printer may encounter will generate an error message and cause the Alert light to flash. If this happens, find the message in the table below and follow the instructions to fix the problem.

Error Message	Problem	Solution
`+12 VDC ERROR`	Power supply output voltage is not within the acceptable operating range.	Shut off the printer. Contact your Intermec service representative.
`+24 VDC ERROR`	Power supply output voltage is not within the acceptable operating range.	Shut off the printer. Contact your Intermec service representative.
`80960 RAM ERROR`	One of the printer's microprocessors cannot access RAM. Printing stops and the control panel locks up. When the printer power is cycled, this message appears.	Cycle the printer power again. If the message reappears, turn off the printer and contact your Intermec service representative.
`80960 ROM ERROR`	The printer's microprocessor cannot access ROM. Printing stops and the control panel locks up. When the printer power is cycled, this message appears.	Cycle the printer power again. If the message reappears, turn off the printer and contact your Intermec service representative.

Error Message	Problem	Solution
AC VOLTS LOW	There is not enough voltage reaching the printer through the AC power cord.	Test the line voltage. If sufficient voltage is reaching the printer, then the problem is internal to the printer and you should contact your Intermec service representative. If the printer is not receiving sufficient voltage, replace the power cord.
CALLS FAULT	The printer microprocessor has detected an internal fault.	Contact your Intermec representative.
CHECKSUM ERROR	Portions or all of the static memory were found to be corrupted and were reset. Some or all of the fonts, UDCs, formats, configuration settings, etc., may have been lost.	Contact your Intermec representative.
COMMUNICATIONS ERROR	Printer is not communicating with the host computer.	Make sure the host is running and all the connections are intact. Press Cont to clear the error.
CUTTER FAULT	The Cutter is not operating properly.	Check to see the cutter is properly maintained and connected. Press Feed / Reload to clear the error.
CUTTER NOT CONNECTED	The cutter is enabled from the control panel but it is not connected.	If you are not using the cutter, disable the cutter command through the menu panel. Otherwise, check the connections between the cutter and the printer. Press Cont to clear the error.
FLOAT FAULT	The printer microprocessor has detected an internal fault.	Contact your Intermec representative.
HEAD LIFT FAULT	The printhead mechanism has jammed and the printhead cannot lift between labels.	Open the printer and press Feed / Reload. If this does not work, contact your Intermec representative.
MACHINE FAULT	The printer microprocessor has detected an internal fault.	Contact your Intermec representative.
MATH FAULT	The printer microprocessor has detected an internal fault.	Contact your Intermec representative.
MEDIA ALERT	The Media Alert command is enabled and the media supply is low.	Replenish the media supply (refer to Chapter 1) or disable the Media Alert command (refer to Chapter 2). Press Feed / Reload to clear this warning.

Error Message	Problem	Solution
MEMORY RESET	Portions or all of the static memory were found to be corrupted and were reset. Some or all of the fonts, UDCs, formats, configuration settings, etc., may have been lost.	Contact your Intermec representative.
OPERATION FAULT	The printer microprocessor has detected an internal fault.	Contact your Intermec representative.
OVERFLOW ERROR 32	Non-immediate command or data received with full buffer.	Send message after buffer has cleared. Press Cont to clear the alert.
OVERFLOW ERROR 37	Not enough room in the printer memory to print the label format. The format fits into memory but there is not enough memory left to print.	Reduce the format complexity by deleting fields or decreasing the amount of data. Press Cont to clear the alert.
OVERFLOW ERROR 42	Not enough room in the printer memory to store the format.	Delete any formats, fonts, or graphics that you no longer need. If the format still does not fit, delete a few fields or other data from the format. Press Cont to clear the alert. ***Note:*** *To see how much printer memory is available, enter <ESC>m at the host.*
OVERFLOW ERROR 43	Too many fields in the label format.	Delete some fields, or reduce the number of characters in the fields. Press Cont to clear the alert.
OVERFLOW ERROR 53	Not enough room for graphic or user-defined font in the label format.	Delete any formats, fonts, or graphics that you no longer need. If there is still not enough room, reduce the size of the font or graphic. Press Cont to clear the alert.
PAPER FAULT	You are out of media, there is a jam in the paper path, or the printer cannot find a label or index marker in the expected place.	Open the printer and check the media path. Make sure the Label Stock and Media Length parameters are set correctly (refer to Chapter 2). Press Feed / Reload to clear the alert.
PAPER PATH OPEN	The printer is open or not properly closed.	Make sure the printer is closed. Press Feed / Reload to clear the message.
PARAMETER ERROR 8	Invalid start or stop characters.	Verify start and stop characters in the label format. Press Cont to clear the alert.
PARAMETER ERROR 11	Invalid data characters.	Verify data characters in label format. Press Cont to clear the alert.

Error Message	Problem	Solution
PARAMETER ERROR 36	Invalid or undefined format or page number.	Verify that the page numbers are between 0 and 9 and the format numbers are between 0 and 19. Press Cont to clear the alert.
PARAMETER ERROR 38	Invalid or undefined field number.	Verify the field number in the label format. Press Cont to clear the alert.
PRINTHEAD COLD	The printhead is too cold to print properly.	Wait for the printhead to heat up. At the right temperature printing starts automatically and the alert clears. If the printer takes too long to heat up, contact your Intermec representative.
PRINTHEAD HOT	The printhead is too hot to print.	Wait while the printhead cools. At the right temperature, printing starts and the alert clears. If the printer takes too long to cool, or continues to overheat, contact your Intermec representative.
PRINTHEAD TEMP SENSOR FAULT	The temperature sensor for the printhead is not working or is disconnected.	The printer will continue to print, but you cannot clear the alert. Contact your Intermec representative.
RANGE ERROR 12	Data count has been exceeded.	Reduce the amount of data entered into this field or increase the field's maximum data (up to 200). Press Cont to clear the alert.
RANGE ERROR 21	Quantity or batch count is out of range.	Quantity of labels should be between 1 and 9999 and there should be 1 and 9999 batches of labels. Press Cont to clear the alert.
RANGE ERROR 22	Increment or Decrement quantity is out of range.	Quantity should be between 1 and 9999. Press Cont to clear the alert.
RANGE ERROR 23	Intercharacter delay or message delay is out of range.	Delay should be between 0 and 9999. Press Cont to clear the alert.
RANGE ERROR 52	Invalid font/graphic height, width, or intercharacter gap.	Font or graphic height and width should be between 1 and 600. Intercharacter gap should be between 0 and 199 dots. Press Cont to clear the alert.

Error Message	Problem	Solution
RECEIVER ERROR	If you are using the Cloning or Selective Transfer commands, the Receiver printer is not receiving the information from the Sender.	Make sure the Receiver printer is turned on and set up correctly for receiving information from the Sender. Check all connections between the Receiver and the Sender printers.
RIBBON FAULT	You are out of thermal transfer ribbon or it is jammed.	Clear the jam or replenish the ribbon stock. Press Feed / Reload to clear the alert.
SELF-STRIP NOT CONNECTED	The Self-Strip option is not connected.	Make sure the Self-Strip assembly is connected properly, or disable this option (refer to Chapter 2). Press Feed / Reload to clear the alert.
SENDER ERROR	If you are using the Cloning or Selective Transfer commands, the Sender printer is not set up properly to send information to the Receiver.	Check all connections between the Sender and the Receiver printers. Make sure the Sender printer is set up correctly for transmitting information to the Receiver.
STATE FAULT	The printer microprocessor has detected an internal fault.	Contact your Intermec representative.
STRUCT FAULT	The printer microprocessor has detected an internal fault.	Contact your Intermec representative.
SYNTAX ERROR 24	Missing preamble or postamble data.	Delete the setup for preamble or postamble data, or include the data. Press Cont to clear the alert.
SYNTAX ERROR 33	Invalid field delimiter. Either a start or end character is missing or they are different types.	Check for all pairs of field delimiters and make sure both are numeric, or both are alphanumeric. Press Cont to clear the alert.
SYNTAX ERROR 34	Invalid escape command.	Correct the escape command syntax. Press Cont to clear the alert.
SYNTAX ERROR 35	Invalid shift command.	Correct the shift command syntax. Press Cont to clear the alert.
SYNTAX ERROR 44	Semicolon (;) missing after <ESC>P.	If data follows <ESC>P you must insert a semicolon (;) to separate commands. Press Cont to clear the alert.
SYNTAX ERROR 46	Statement does not make sense.	Check the statement syntax. Press Cont to clear the alert.

Error Message	Problem	Solution
SYNTAX ERROR 54	Invalid UDC command.	Correct the UDC command syntax. Press Cont to clear the alert.
TRACE FAULT	The printer microprocessor has detected an internal fault.	Contact your Intermec representative.
TYPE FAULT	The printer microprocessor has detected an internal fault.	Contact your Intermec representative.

Error Codes

Most of the problems you may encounter with the 4630 and 4830 printers cause the printers to send an error code to the host. If this happens, find the error code in the table and complete the instructions to correct the problem.

Error Code	Description
00	No error
01	Invalid bar code check character
02	Invalid number of bar code characters (Code UPC/EAN)
04	Bar code check character within numeric field marks
05	Supplemental delimiter within numeric field marks (Code UPC/EAN)
06	Invalid supplemental character count (Code UPC/EAN)
07	More than one supplemental delimiter (Code UPC/EAN)
08	Invalid start/stop characters (Codabar)
11	Invalid bar code data
12	Data count exceeded
13	Data is being entered into a non-data entry field
21	Quantity or batch count out of range
22	Field increment or decrement out of range
23	Intercharacter/message delay out of range
24	Missing preamble or postamble data
25	Invalid format transmission syntax
26	Invalid page transmission syntax
27	Invalid font transmission syntax
28	Invalid UDC transmission syntax

Error Code	Description
32	Non-immediate command or data received after buffer is full
33	Invalid field marks
34	Invalid escape command
35	Invalid data shift command
36	Invalid or undefined format number
37	Insufficient room in RAM to print format
38	Invalid or undefined field number
41	Syntax error for Program Commands
42	Insufficient room in RAM to store format
43	Too many fields
46	Undefined statement
52	Invalid UDC or UDF bitmap cell height / width or intercharacter space
53	Insufficient room in RAM to store UDC or UDF
54	Invalid UDC command syntax

Using the Print Tests

The printer software provides several tests you can use to print pages, formats, fonts, and graphics that are currently stored in printer memory. These tests are useful when changing label formats so you can review your design options.

Command	Selections
Print Page	Print 1 to 99 copies of any page number (0 through 9), or print all pages.
Print Formats	Print 1 to 99 copies of any format number (0 through 19), or print all formats.
Print Fonts	Print any font number (0 through 25), or print all fonts.
Print Graphics	Print any graphic number (0 through 99), or print all graphics.

To print test labels of pages, formats, fonts, or graphics

1. From the OFFLINE READY display, press Menu and then press ↑ or ↓ until you reach the Service menu.
2. Press Select and then press ↑ or ↓ until you see the item you want to print, for example:

   ```
   SERVICE MENU
   PRINT PAGE
   ```

3. Press Select and then press ↑ or ↓ until the display shows the number of the item you want to print.
4. Press Select. The display shows one of the following prompts:
   - If you selected all pages, all formats, or any fonts or graphic, the display shows an EXECUTE TEST prompt.
   - If you selected a specific page or format, press ↑ or ↓ until you reach the number of copies you want to print, and then press Select.
5. Press Enter at the EXECUTE TEST prompt to print the test label.

Printing Data Sent From the Host

If you need a hard copy of the data that is sent to the printer from the host, you can set the printer to Data Line Print. When the printer is in Data Line Print mode, it prints all incoming data as ASCII characters (including control characters) with the hexadecimal value underneath each character.

To access Data Line Print mode

1. From the OFFLINE READY display, press Menu and then press ↑ or ↓ until you reach the Service menu.
2. Press Select and then press ↑ or ↓ until the display shows:

   ```
   SERVICE MENU
   DATA LINE PRINT
   ```

3. Press Select and then press ↑ or ↓ to enable Data Line Print mode.
4. Press Enter to activate Data Line Print mode.

Exit the Service menu to disable Data Line Print mode.

Note: *If you press Feed/Reload while the printer is in Data Line Print mode, the software version number is transmitted to the host. You can use this feature to perform a loop-back test at the communications port.*

Increasing Available Memory

If you need to increase the amount of memory available in your printer, you can purchase extra memory from Intermec. Intermec provides 1MB and 4MB storage memory modules for holding fonts and graphics and extra image memory SIMMs in 4MB and 16 MB capacities. You can also use one of the Memory Reset commands to clear pages, formats, fonts, and graphics from printer memory. Using any of the Memory Reset commands will destroy any data that you have previously downloaded to the printer.

To reset printer memory

1. From the OFFLINE READY display, press Menu and then press ↑ or ↓ until you reach the Service menu.
2. Press Select and then press ↑ or ↓ until the display shows:

   ```
   SERVICE MENU
   MEMORY RESET
   ```

3. Press Select and then press ↑ or ↓ until you see the item you want.
4. Press Enter to clear fonts / graphics or pages / formats from printer memory.

Print Quality

The 4630 and 4830 printers were designed and configured at the factory to provide maximum print quality for both direct thermal and thermal transfer media.

It is important that you select the proper media when printing at higher speeds. Using good quality media reduces the occurrence of images that fade or bleed. If you want to print quality labels at higher print speeds, you must select media with low reaction or release imaging temperatures. Printing at lower speeds produces the highest quality labels. Please consult your Intermec representative to decide the proper media for your application.

There are many factors that need to be considered before you can achieve maximum print quality. These factors are addressed in the following sections.

Media Selection

The choice of media is one of the most important decisions you can make concerning print quality. The printer supports a wide selection of both direct thermal and thermal transfer media. To achieve optimum performance in your application, you must evaluate requirements such as print speed and environmental conditions.

Please consult your Intermec representative to ensure that you select the proper media for your application.

Print Speed

The print speed you select greatly affects the printed image. Therefore, it is important to select the proper media when printing at higher speeds. The highest quality labels are produced at lower speeds. Optimal print quality for most direct thermal media is achieved at speeds below 3.5 ips.

In order to achieve optimal print quality at speeds greater than 6.0 ips, you may need to fine-tune the printer controls. At higher print speeds, it is important to properly set the dark adjust feature.

Formats

Formats can be modified to improve print quality and print speed. At high speeds, the best quality bar codes are produced when the drag orientation (perpendicular to paper motion) is used. For more information on formats, please refer to Chapter 5, “Designing Labels Using IPL Commands.”

Dark Adjust

The dark adjust feature allows tuning of energy levels to optimize print quality. If you set too high of a darkness level, you may reduce printhead life. We recommend that you initially leave the dark adjust at zero.

A darkness setting of zero should provide optimal print quality; however, in order to maintain print quality, you may need to adjust print darkness under the following conditions:

- Change in print speed
- Change in media type (direct thermal to thermal transfer and vice versa)
- Printhead wear
- Using large amounts of media

Refer to “Setting the Dark Adjust” in Chapter 2 for more information.

Printhead Aging

Print element wear is common in thermal printers. Over the life of a printhead, wear can result in a change of resistance in the print elements. The change in element resistance affects the print quality. If needed, the change in resistance can be compensated for by using the Dark Adjust command.

5

Designing Labels Using IPL Commands

This chapter explains how to design and print your own labels using the Intermec Printer Language (IPL) command set. It covers the basic elements of label design and provides examples to guide you in designing your own labels. At first, these printer commands may seem cryptic, but you can quickly learn to use them once you begin designing labels.

Using Label Formats

To print a label using the 4630 or 4830 printer, you must first specify a label format and then send data to fill in the appropriate fields in the format. A label format defines how the information prints on a label. For example, if you want to print a number on a label, the label format must indicate the location of the number, its font and size, and whether the number has a vertical or horizontal orientation.

Chapter 6, "Intermec Printer Language Commands," contains a complete alphabetical listing of all of the Intermec printer commands and their purpose, syntax, and any other necessary information.

Storing Label Formats

When you define a label, either by downloading printer commands or by using a label generation program, the printer stores the format in RAM. Once you store a label format in the printer, you can use it at any time to print labels. You can also upload the label format to the host computer and use Program mode to modify one or more of its fields.

Designing and Creating a Label Format

Label formats are combinations of several different fields that determine where and how different types of data appear in the label design. The fields on a label may differ in size, location, orientation, and data type. You must define information that you plan to print on the label as a field in the label format. Once you define the fields, you can pass data into the fields and print them. The following tutorial assumes that you are using the IPL command set.

To design a basic label format

1. Using a label from your roll of media, sketch an example of a format that you want to create.

   Your format can include any or all of these fields:

   - Human-readable (text)
   - Bar code
   - Line
   - Box
   - User-defined characters (UDCs) or graphics

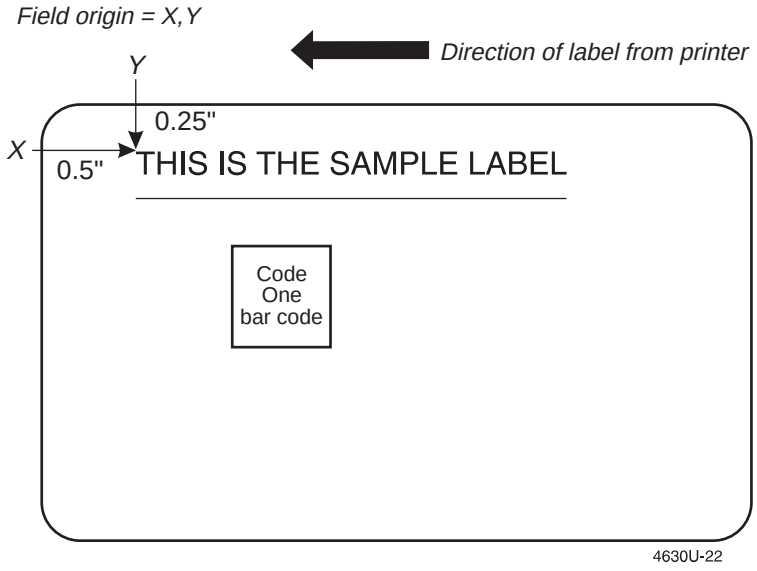
   In this example, you will design a simple label that includes a human-readable field, a line field, and a bar code field.

2. Determine the placement of each field from the label origin. To determine the horizontal or X origin of each field, measure the distance from the left side of the label to the upper left corner of the field.

   To determine the vertical or Y origin of each field, measure the distance from the top of the label to the upper left corner of the field.

   When you combine the two numbers, they form the field origin oX,Y.

   In the following illustration, the horizontal or X origin of the human-readable field measures 0.5 inch from the left side of the label and the vertical or Y origin measures 0.25 inch from the top of the label.



3. Convert the measurements for the human-readable field from inches to dots. Use this equation:

   1 inch (25.4 mm) = 300 dots
   1 mm = 16 dots

   In this example, the human-readable field origin in dots is:

   0.5 inch x 300 dots = 150 dots (X dimension)
   0.25 inch x 300 dots = 75 dots (Y dimension)

   The origin for the human-readable field is o150,75 (oX,Y).

4. Convert the measurements for the line field and the bar code field to complete this example.

To create or program the label format

1. Choose a bar code symbology and a human-readable font that suit your needs.

   For this example, you are going to use the proportional outline font and the Code One symbology. See Chapter 6, "Intermec Printer Language Commands," for information on the different symbologies and fonts available to you.

2. Define the parameters for each type of field in the format.

This Type of Field	Is Represented By
Human-readable (text)	H
Bar code	B
Line	L
Box	W
User-defined characters (UDCs) or graphics	U

   See "Listing Printer Commands by Function" in Chapter 6 for a list of the parameters you can define for each type of field.

For example, you need to define the following parameters for a human-readable field:

Parameter	Value for This Example
field type	`H0`
field origin	`o150,75`
font	`c28` (proportional outline font)
field direction	`f0` (horizontal)
height	`h30` (multiplied 30 times)
width	`w30` (multiplied 30 times)
field source and number of characters	`d0,20`

3. Create command strings for each type of field. You must bracket your field information between the start of text character (<STX>) and the end of text character (<ETX>).

   When you combine the parameters in the previous table into a command string, it should look like this:

   `<STX>H0;o150,75;c28;f0;h30;w30;d0,20;<ETX>`

4. Combine the command strings you define into one file and add the following commands bracketed by <STX> and <ETX>:

Command	Description
`<ESC>P`	Enters Program mode
`E4;F4;`	Erases what was in format 4 and creates a new format 4
`R`	Saves the format and exits to Print mode
`<ESC>E4`	Accesses format 4
`<ETB>`	Prints the format

5. Create the data lines for the human-readable field and the bar code field. Do this by completing the following tasks:

   a. Type the information that you want to appear in the human-readable field and the bar code field on two separate lines.

   b. Separate the information with a <CR> at the end of the first text string.

      The <CR> tells the printer to enter the text into the next field. The first line will be the text for the human-readable field and so on.

c. Preface the data lines with the <CAN> command. It erases all data in the current format.

   Your command strings should look like this:

   ```
   <CAN>
   THIS IS THE SAMPLE LABEL <CR>
   SAMPLE
   ```

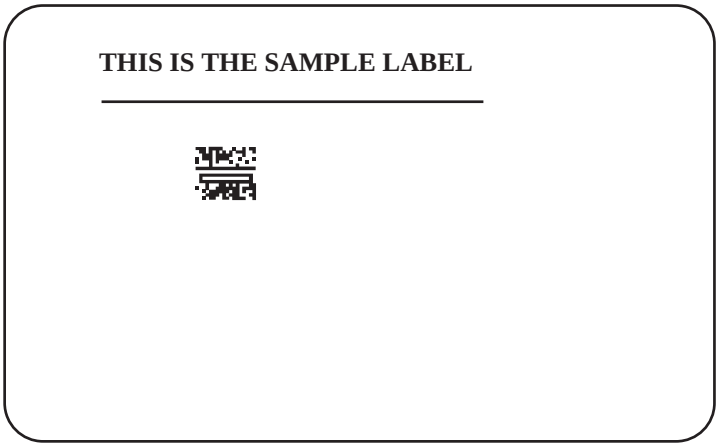
d. Bracket the command strings between <STX> and <ETX>.

6. Combine all of the command strings into one format and it should look like this:

Command	Definition
<STX><ESC>P<ETX>	Enter Program mode
<STX>E4;F4;<ETX>	Erase format 4, create format 4
<STX>H0;o150,75;f0;c28;h30;w30;d0,30;<ETX>	Edit / create human-readable field 0
<STX>L1;o150,75;f0;l600;w5;<ETX>	Edit / create line field 1
<STX>B2;o300,125;c13,0;h7;<ETX>	Edit / create bar code field 2
<STX>R;<ETX>	Save format and exit to Print mode
<STX><ESC>E4<ETX>	Access format 4
<STX><CAN><ETX>	Erase all data
<STX>THIS IS THE SAMPLE LABEL<CR><ETX>	Data for human-readable field 0
<STX>SAMPLE<ETX>	Data for bar code field 2
<STX><ETB><ETX>	Print

Note: *The line breaks in this example are shown for formatting purposes only and do not necessarily represent carriage returns. Also, the difference between the lowercase letter "l" and the numeral "1" is not very noticeable in the Courier font. Make sure that you enter the correct command.*

This format prints the following label:



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Defining Label Design Fields

You define each type of field to hold a certain type of data. You can define:

- Bar code fields (with or without interpretive fields)
- Human-readable fields
- Graphic fields
- Line fields
- Box fields

You must define the data you plan to print on your label as a field in the label format. Each field type gives you options for interpreting your data. The fields that contain the most options are bar code fields and human-readable fields.

Bar Code Fields

You can print bar codes in any of the symbologies listed below:

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

Appendix A, “Printer Reference,” contains a full description of each bar code symbology. You can also refer to Chapter 6, “Intermec Printer Language Commands,” for a complete list of commands to select the appropriate bar code symbology.

Human-Readable Fields

You can print human-readable fields in any one of the printer’s internal fonts or user-defined fonts. Your printer contains several scaleable fonts as well as numerous resident bitmap fonts in a wide range of sizes and styles.

You can change the size of the font character by using the width and height magnification or by using the pitch or point-size commands. The fonts themselves remain unchanged. The font character charts in Appendix A, “Printer Reference,” illustrate the complete character set for each font.

The printer supports nine different 7-bit international character sets for each command set mode. The printer also contains two 8-bit character sets for IBM translation, 256 Characters and Code Page 850.

The internal bitmap fonts of the printer include

- four standard bitmap fonts measured in dots
- two bitmap fonts recognized by optical character recognition (OCR) programs
- three bitmap fonts measured in point sizes
- three outline fonts
- fifteen bitmap monospaced fonts

Downloading User-Defined Fonts

In addition to the fonts permanently resident in your printer, you can also download user-defined fonts (UDFs) in the form of bitmap (fixed) or outline (scaleable) fonts.

Bitmap fonts commonly

- print in multiples of one fixed size.
- print quickly.
- are memory intensive when defined as large characters.

Outline fonts commonly

- vary in size. (You can print any size character up to 2 inches.)
- print smooth characters at any magnification.
- image smaller font sizes slower than bitmap fonts.

The 4630 and 4830 printers support Bitstream's Speedo format outline fonts. For help locating Speedo fonts, contact your Intermec representative.

You can download user-defined fonts (UDFs) to the printer and store them in the non-volatile memory. Although the printer reserves 16 font ID numbers (3 to 6, and 8 to 19) for UDFs, memory constraints may limit the number of fonts you can store.

The easiest way to download fonts to the printer is with the PrintSet printer installation software. This application is on the disk shipped with your *4630 and 4830 Bar Code Label Printers Getting Started Guide*. You can use PrintSet to select fonts and directly download them to your printer from a PC. If you do not have your printer connected to a PC, you can use PrintSet to create a .PCF configuration file that you can save and then download to your printer. You also have the ability to edit .PCF files using IPL commands.

How you download UDFs depends on the font type. The next sections describe how to download bitmap fonts and outline fonts.

Downloading Bitmap Fonts

Use PrintSet to select and download bitmap fonts.

Bitmap fonts can use a lot of memory, so you may decide not to download the entire font to the printer. You can use PrintSet to define a subset of the font (only the numbers, for example). Then you can download only that subset, saving storage space on the printer.

The printer requires that bitmap fonts be in six bits per byte format and PrintSet automatically converts all bitmap fonts into this format. To learn more about bitmap font formats, see "Creating User-Defined Fonts" later in this chapter.

Downloading Outline Fonts

Use PrintSet to select and download Bitstream's Speedo outline fonts to your printer.

PrintSet automatically converts outline fonts into nibblized data that you can download to the printer. PrintSet can also convert outline fonts into bitmap fonts that you can download to the printer. You can then either directly download the outline font to the printer or save the converted outline font data to a .PCF file that you can edit and use in other applications.

If you need to download an outline font but you cannot use PrintSet, you can create a program to convert the outline font to a format you can download to the printer.

When you convert an outline font to a format that you can download to the printer, you must change the font character data into nibblized data that the printer can interpret. When you nibblize data, you divide each byte of data into two bytes. For example, byte 0xab becomes two bytes: 0x41, 0x42.

Here is an example of a nibblized outline font file that includes IPL commands to send the font file directly to the printer.

Command	Definition
<STX>R<ESC>C<ESC>P<ETX>	Enter Program mode.
<STX>J03,Times,1;<ETX>	Create Speedo font 3 and give it the name Times.
<STX>j000100000011010000040060 4c545348efe24cd0000002d8000000e04f532f3293e1900d000003b80000004e56444d58ed68bcf400000408000001770636d617053c2bcba000142ac000002906376742 0beed8c5300001b78000006ae6670676d61beec3b00002228000005396 76c79668b49591e0000276400;<ETX>	Speedo data string.
<STX>j00ebf468646d78d956f5ab000113580000150868656164af3277ec00012860000000 36686865610ef00652000128980000002468 6d74788b9237d2000128bc000003706b65726e fe84fb7b00012c2c000002b86c6f6361a4806 d8c0000011c000001bc6d617870051a043300 012ee4000000206e616d6578ca;<ETX>	Speedo data string.
<STX>j0d2000012f04000006a3706f7374d43c8176000135a8000001ec707265701cbb23d4 0001379400000b170000003b003b003b003b0 098011201f702fc03ff05120554059605d706 bd07250770079c07c80801089a090c09e10ac a0b530c060cb90d260e280ee80f300f920ffc 104310b1116612ca13cd154315;<ETX>	Speedo data string.
⋮	Several Speedo data strings not shown due to space constraints.
<STX>j00b3008200b0008725ba0000;<ETX>	Last Speedo data string.
<STX>R<ETX>	Exit Program mode

To convert and download an outline font to your printer

1. Nibblize the font data.

   Note: *Divide the nibblized data into separate lines preceded with a "j" for these reasons: (1) you need short lines for limited message length protocols and (2) it is easier to modify using an editor or word processing program.*

2. Include IPL commands to instruct the printer what to do with the font data. For help, see the next example and Chapter 6, "Intermec Printer Language Commands."

Lines and Boxes

Use the command set (see Chapter 6, "Intermec Printer Language Commands") to define line or box fields on a label. You can use the commands to determine whether a box or line appears vertically or horizontally and to set the line length and thickness.

The following example uses vertical and horizontal lines to separate fields on a label, and uses a box field to make a label border. This format uses **bold text** to highlight the lines that contain line or box fields. This label format prints the label shown on the page following it.

Lines and Boxes Format

```
<STX><ESC>C1<ETX>
<STX><ESC>P;<ETX>
<STX>E4;F4,Demo 4;<ETX>
<STX>H00;o0,30;f0;h1;w1;c21;r0;b10;d3,       SHIPPING LABEL       ;<ETX>
<STX>H01;o20,160;f0;h1;w1;c0;r0;b0;d3,BASIS WT. 39-4838;<ETX>
<STX>H02;o20,180;f0;h1;w1;c21;r0;b0;d3,38448379237;<ETX>
<STX>H03;o640,160;f0;h1;w1;c0;r0;b0;d3,GRADE DESCRIPTION;<ETX>
<STX>H04;o600,180;f0;h1;w1;c21;r0;b0;d3,A-PLUS QTY;<ETX>
<STX>H05;o20,300;f0;h1;w1;c0;r0;b0;d3,ROLL WIDTH   536-0333;<ETX>
<STX>H06;o20,310;f0;h1;w1;c21;r0;b0;d3,338438;<ETX>
<STX>H07;o420,300;f0;h1;w1;c0;r0;b0;d3,ROLLS/PKG.;<ETX>
<STX>H08;o450,310;f0;h1;w1;c21;r0;b0;d3,12;<ETX>
<STX>H09;o640,300;f0;h1;w1;c0;r0;b0;d3,ORDER ITEM NUMBER;<ETX>
<STX>H10;o640,310;f0;h1;w1;c21;r0;b0;d3,234-LOFT;<ETX>
<STX>H11;o20,410;f0;h1;w1;c0;r0;b0;d3,CUSTOMER ORDER NUMBER;<ETX>
```

<STX>H12;o20,420;f0;h1;w1;c21;r0;b0;d3,372181192;<ETX>

<STX>H13;o470,410;f0;h1;w1;c0;r0;b0;d3,LOCATION-PACKAGE NUMBER-GRADE;<ETX>

<STX>H14;o520,420;f0;h1;w1;c21;r0;b0;d3,3839494;<ETX>

<STX>H15;o980,410;f0;h1;w1;c0;r0;b0;d3,WEIGHT;<ETX>

<STX>H16;o980,420;f0;h1;w1;c21;r0;b0;d3,230;<ETX>

<STX>H17;o20,520;f0;h1;w1;c0;r0;b0;d3,LOAD NUMBER OR TRACKING NUMBER;<ETX>

<STX>H18;o20,530;f0;h1;w1;c21;r0;b0;d3,3392-AZ;<ETX>

<STX>H19;o530,520;f0;h1;w1;c0;r0;b0;d3,ROLL NUMBER;<ETX>

<STX>H20;o530,530;f0;h1;w1;c21;r0;b0;d3,37282833;<ETX>

<STX>H21;o940,520;f0;h1;w1;c0;r0;b0;d3,ROLL POSITION;<ETX>

<STX>H22;o940,530;f0;h1;w1;c21;r0;b0;d3,400;<ETX>

<STX>L32;o0,280;f0;l1176;w2;<ETX>

<STX>L33;o560,114;f3;l166;w2;<ETX>

<STX>L34;o0,392;f0;l1176;w2;<ETX>

<STX>L35;o400,280;f3;l112;w2;<ETX>

<STX>L36;o600,280;f3;l112;w2;<ETX>

<STX>L37;o0,504;f0;l1176;w2;<ETX>

<STX>L38;o460,392;f3;l112;w2;<ETX>

<STX>L39;o960,392;f3;l112;w2;<ETX>

<STX>L40;o0,616;f0;l1176;w2;<ETX>

<STX>L41;o510,504;f3;l112;w2;<ETX>

<STX>L42;o930,504;f3;l112;w2;<ETX>

<STX>B51;o20,640;c0,0;f0;h100;w2;r1;i2;d3,INTERMEC;<ETX>

<STX>B52;o560,640;c0,0;f0;h100;w2;r1;i2;d3,372181192;<ETX>

<STX>I51;o20,746;f0;h1;w1;c0;r0;b0;<ETX>

<STX>I52;o560,746;f0;h1;w1;c0;r0;b0;<ETX>

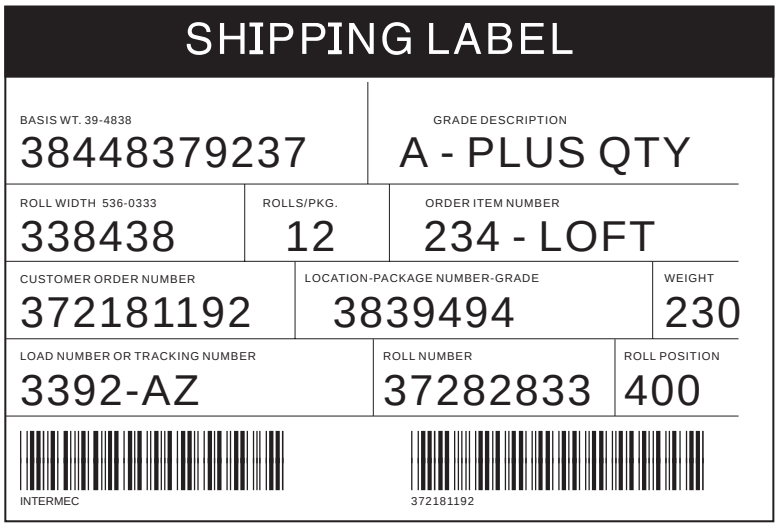
<STX>W53;o0,0;w4;l1180;h780;<ETX>

<STX>R;<ETX>

<STX><ESC>E4<ETX>

<STX><RS>2<ETB><ETX>

Lines and Boxes Label



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Graphics

You must define a graphic field if you want to print a graphic image on a label. Before you can use this field, you need to download the graphic to the printer. Once you download the graphic, you can use it in any format.

Use the PrintSet printer installation software to easily download graphics to the printer. PrintSet automatically converts the graphic into a six bits per byte format that your printer can understand.

If you are using third-party label-generation software, convert your graphic file to a UDC format that the printer can interpret. After you convert the graphic, download it to the printer with IPL commands or PrintSet.

If you want to design your own graphic, refer to "Creating User-Defined Graphics" later in this chapter. You must send graphics as six bits per byte bitmap images. The maximum size that you can define a graphic to be is 3 x 3 inches (900 x 900 dots).

Editing Label Formats and Working With Fields

In addition to understanding the different types of printable fields on the printer, you need to know how to arrange them to define or change the format of a label. The following sections use examples to describe the commands that position, size, rotate, and edit label fields. For a complete list of all programming commands, see Chapter 6, "Intermec Printer Language Commands."

Whenever you create a format, the printer automatically creates a human-readable field zero (H0) along with it. The printer creates the H0 field with all field parameters set to the default setting. You can only delete field zero after you create one or more other fields. You cannot delete the last field in a format. The defaults for the H0 field are:

Command	Definition
`o0,0;`	Field origin is 0,0.
`f0;`	Field direction is horizontal with respect to the label motion from printer.
`h2;`	Field height magnification is two.
`w2;`	Field width magnification is two.
`c2;`	Selects the 10 x 14 standard font.
`b0;`	Selects no border around human-readable field.
`r0;`	Selects horizontal orientation of characters.
`d0,30;`	You enter variable data in Print mode. The maximum number of characters you can enter into this field is 30.

When creating a new format field, it is not possible to specify field zero as anything other than human-readable field zero (H0) without creating another field first. For example, you cannot make field zero a bar code field by doing the following:

```
<STX><ESC>P;E1;F1;B0;<ETX>
```

To make field zero a bar code field, you have to delete human-readable field 0 and then define bar code field 0. To do this, you must create a temporary field (L1) before you delete human-readable field zero (H0):

```
<STX><ESC>P;E1;F1;L1;D0;B0;D1;<ETX>
```

This table describes each command in the string:

Command	Definition
<ESC>P;	Enters Program mode
E1;	Erases format 1
F1;	Creates format 1
L1;	Creates line field (temporary field)
D0;	Deletes field zero
B0;	Creates bar code field zero
D1;	Deletes field 1

When numbering the fields in a format, it is important to remember to give every field a different number. Never use a field number more than once. You can have up to 200 fields numbering from 0 to 199. The importance of field numbering comes into play when you are in Print mode and are entering data into the label format. At this point, you can only identify the fields by a number, not by what type of field.

Also keep in mind that you enter data into fields according to their numeric value if you use a <CR> to separate the data. In other words, the first string of data you enter goes into the lowest numbered field, the second string of data you enter goes into the next lowest numbered field, and so on.

Editing Existing Fields

If you make a mistake in a label format, you may not have to download the entire format again depending on the severity of the mistake. You can change a specific field in a format by sending a command in Program mode. You can modify just the incorrect format field(s) instead of having to download the entire format again.

The printer uses a field pointer to point to the field that you are going to modify when the printer is in Program mode. The pointer continues to point to the most recently selected field until you select a different format or field.

Use the following format as an example. Assume you have downloaded the following format to the printer:

Commands	Description
<STX><ESC>P<ETX>	Enters Program mode
<STX>E3;F3;<ETX>	Erases format 3, Create format 3
<STX>H0;o160,200;f0;c0;d0,16;h1;w1;<ETX>	Creates field H0
<STX>H1;o160,240;f0;c0;d0,16;h1;w1;<ETX>	Creates field H1
<STX>H2;o160,300;f0;c2;d0,14;h1;w1;<ETX>	Creates field H2
<STX>H3;o160,380;f0;c2;d0,16;h1;w1;<ETX>	Creates field H3
<STX>B4;o160,0;f0;c0,1;h100;w2;d0,11;i0;p@;<ETX>	Creates field B3
<STX>R;<ETX>	Saves and exits to Print mode

Download the following command string to change field 3 to h2;w2; and thereby change the height to 2 dots:

<STX><ESC>P;F3;H3;h2;w2;R;<ETX>

The following table describes each command in this string:

Command	Description
<ESC>P	Enters Program mode
F3;	Accesses format number 3 from memory
H3;	Accesses field 3
h2;	Sets the height to 2 dots
w2;	Sets the width to 2 dots
R;	Returns to Print mode

Note: *The <STX> and <ETX> commands mark the beginning and end of a message. The semicolon (;) is the command terminator. All commands in Program mode must end with this terminator except the last command in a message.*

Deleting Fields

It is possible to delete any field from a format except for the last field. You can use the following command string to delete field 3 from format 4.

<STX><ESC>P;F4;D3;R;<ETX>

The following table describes each command in this string:

Command	Description
<ESC>P;	Enters Program mode
F4;	Accesses format 4
D3;	Deletes field 3
R;	Returns to Print mode

Positioning Fields

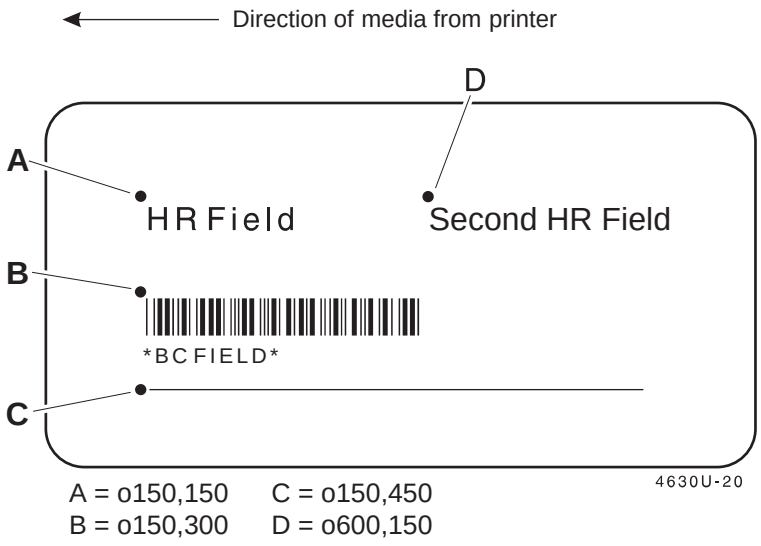
Using the IPL command language to position fields is the trickiest part of designing labels. Since you cannot tell exactly how the field looks until it prints, you may need to make several test prints before you get the field positioned correctly.

For all types of fields, you determine the print position by defining the coordinates of the upper left corner of the unrotated field.

The field origin is the upper left corner of an unrotated field. To define the coordinates of the field origin, you use the origin command (oX,Y) where o is the command that specifies origin, X is the distance from the left side of the label, and Y is the distance from the top of the label.

The X and Y coordinates of the field origin are measured in dots. There are 300 dots per inch, or 12 dots per millimeter.

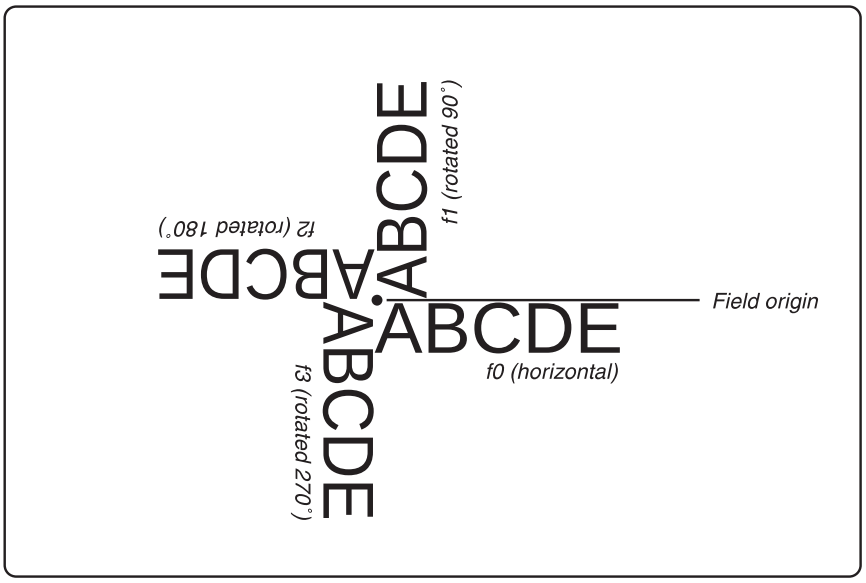
To position a field to print approximately 0.5 inch (13 mm) from the left side and 1 inch (25 mm) from the top of your label, the origin command is o150,300.



Rotating Fields

You can rotate any type of printable field in increments of 90 degrees counterclockwise around the field origin. To position a rotated field, you should keep in mind that the field origin remains on the corner where it was before you rotated the field. If you rotate a field 90 degrees counterclockwise, the origin that was at the upper left corner is now at the lower left corner. Use the field direction command f*n* to define the field rotation. See Chapter 6, "Intermec Printer Language Commands," for more information.

- To rotate a field 90 degrees, you must position the lower left corner of the rotated field.
- To rotate a field 180 degrees, you must position the lower right corner of the rotated field.
- To rotate a field 270 degrees, you must position the upper right corner of the rotated field.



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Scaling Fields

You can determine the size of a field by the font or graphic you use and the field magnification factors you apply. The human-readable fonts and bar code symbologies have default sizes, and the user-defined character fields print as large as you design them (up to the maximum), but you can scale each of these fields even further by using magnification commands.

Magnifying Fonts and Character Fields

The internal fonts in the printer already have sizes associated with them. For example, the letters in font c0 are 7 dots wide by 9 dots high, with a 1-dot gap between characters. If you design a field that prints 10 letters in font c0, the field will be 158 dots wide by 18 dots high.

Note: *The default magnification for a field is 2x2.*

By applying magnification factors (h for height and w for width) you can increase a field's height or width. If you increase the height to 4 (h4) for the field described above, the field height doubles, and the final field prints 158 dots wide by 36 dots high. If you change the height magnification to h6, the field height triples, and the field prints 158 dots by 72 dots.

Increasing the width of a text field to 4 (w4) makes each letter in the field twice as wide. If you did this to the example text field, with field height h2, the final field would print 318 dots wide by 18 dots high.

Magnifying Bar Code Fields

You can also use height and width command to modify bar code fields, but the commands do not behave the same as with human-readable fields.

For bar code fields, the height magnification is the actual dot height of the bar code. If you choose a height magnification of h20, the height of the bar code field will be 20 dots.

Printing narrow bar codes conserves space on each label as well as media. However, if you plan to scan bar codes from a distance, you may need to magnify the bar code widths.

The width magnification factor for bar code fields refers to the width of the narrowest element of the bar code. The minimum bar code width is 2.5 mil for drag mode only. When you specify a narrow element width of w3, the width of the narrowest element in the symbology is 3 dots wide. The spaces and large element widths grow according to preset ratios for each symbology.

Note: *You can only print a bar width of 1 if you are printing in drag mode. If you select a width of 1 in picket mode, the printer defaults to 2.*

The default height for bar code fields is 50 dots, and the default width for narrow elements is 1 dot. You can magnify bar code fields to print up to 9999 dots high, with a narrow element of up to 999 dots wide, but it requires special equipment to scan a bar code that wide.

Note: *If you are using the POSTNET symbology, follow the rules for magnifying fonts.*

Designing Pages

A page is a collection of one or more formats that you combine to print at the same time. This feature is helpful when you need to print several different labels for application at once. For example, you may need to attach one type of label to a product, and a different label to its container. With the page printing capability, you can print both labels at the same time. Being able to print pages of several formats at once also allows you to print labels on media rolls that have different sizes and shapes of labels already precut.

When you group label formats into a page, you assign the formats to positions designated by the letters a through z. You can print the formats used in pages independent of each other. The format example at the end of this chapter shows how to create a page that contains five different formats.

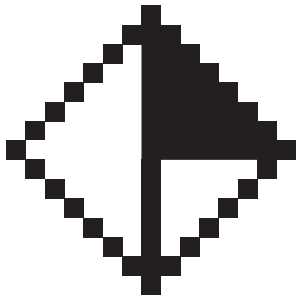
Creating User-Defined Graphics

When you create user-defined graphics (user-defined characters, or UDCs) for the 4630 or 4830 printer, they need to be in six bits per byte format. To use the UDC in a format, you must first define a graphic field using the IPL command U*n*[,*name*]. For help using this command (User-Defined Character Field, Create/Edit), see Chapter 6, "Intermec Printer Language Commands."

Eight bits (0 through 7) compose every byte, but the printer only uses bits 0 through 5 to map the image. You must always set bit 6 (the seventh bit) to 1 so you can download data to the printer. 7-bit hosts reserve bit 7 (the eighth bit) for parity and compatibility. Please refer to "Creating User-Defined Fonts" later in this chapter for an illustrated example of creating a six bits per byte font.

To download a six bits per byte graphic

1. Draw the graphic on graph paper. For example,



2. Change the graph paper drawing into a pattern of ones (square is filled) and zeros (square is empty).

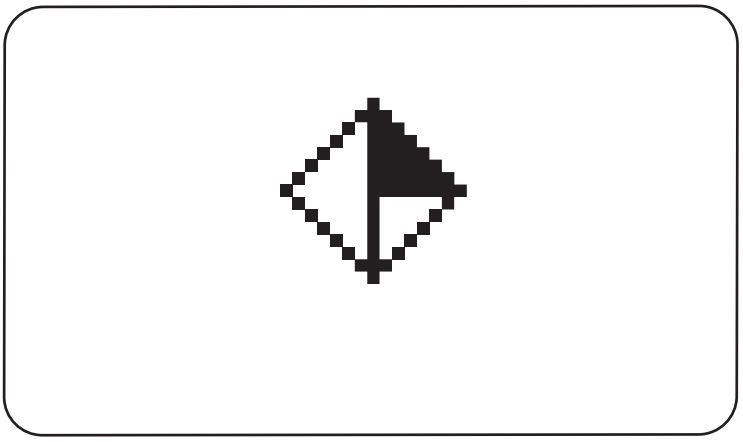
3. Starting from the top row, divide each vertical column into groups of six digits. (If the bottom group has less than six digits, add zeros to this group until it also has six.) The six digits in each group are the six bits that you download in a byte of data. The top digit of each group is bit 0, the bottom digit is bit 5.
4. Add a 1 in the bit 6 position, and then add a 0 in the bit 7 position so that each group now has eight digits. (Eight digits complete the byte.)
5. Starting with the first group of 8 bits in the first column, reverse the order of each group so that bit 0 is now last and bit 7 is first. Work from the top of each column to the bottom. Each eight-digit group is now a binary representation of an ASCII character.
6. Translate each eight-digit group into an ASCII character according to the full ASCII chart in Appendix A, "Printer Reference."
7. Download the graphic so that each column is represented by a command string.

Here is the format for the diamond shape graphic in six bits per byte format with ASCII characters.

Command	Definition
<STX><ESC>P<ETX>	Enter Program mode
<STX>G2,diamond;x15;y15;<ETX>	Create UDC bitmap 2 (diamond), 15 rows by 15 columns
<STX>u0,@B@;<ETX>	Define column 0
<STX>u1,@E@;<ETX>	Define column 1
<STX>u2,`H@;<ETX>	Define column 2
<STX>u3,PP@;<ETX>	Define column 3
<STX>u4,H`@;<ETX>	Define column 4
<STX>u5,D@A;<ETX>	Define column 5
<STX>u6,B@B;<ETX>	Define column 6
<STX>u7,<DEL><DEL>G;<ETX>	Define column 7
<STX>u8,~CB;<ETX>	Define column 8
<STX>u9,|CA;<ETX>	Define column 9
<STX>u10,xc@;<ETX>	Define column 10
<STX>u11,pS@;<ETX>	Define column 11
<STX>u12,`K@;<ETX>	Define column 12
<STX>u13,@G@;<ETX>	Define column 13
<STX>u14,@B@;<ETX>	Define column 14
<STX>R;<ETX>	Save and exit to Print mode

After downloading the graphic to the printer, download the following format to see how the graphic prints. A label similar to the one following the format prints:

Command	Definition
<STX><ESC>P<ETX>	Enter Program mode
<STX>E4;F4<STX>	Create format 4
<STX>U1;o1050,650;c2;w20;h20;<ETX>	Create graphic field 1, origin of 1050,650, use graphic 2, and magnify it by a factor of 20
<STX>R;<ETX>	Save and exit to Print mode
<STX><ESC>E4<ETX>	Select format 4
<STX><ETB><ETX>	Print



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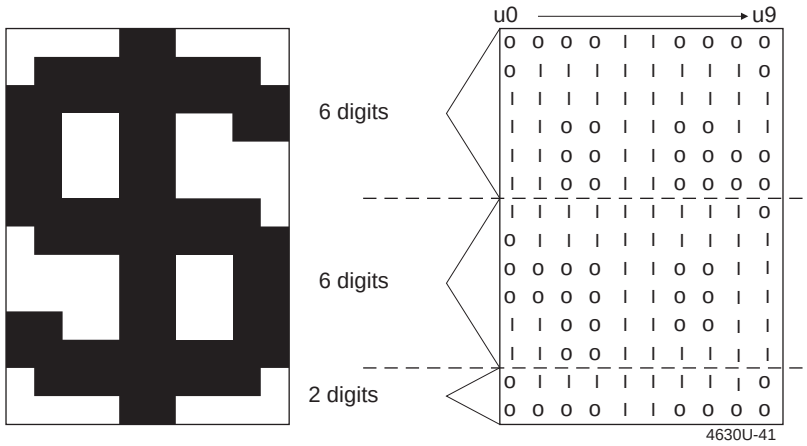
Creating User-Defined Font

Each data byte represents six bits in the bitmap. The following example lists the command and data required to define a font with the two characters "$" (t36) and "i" (t105).

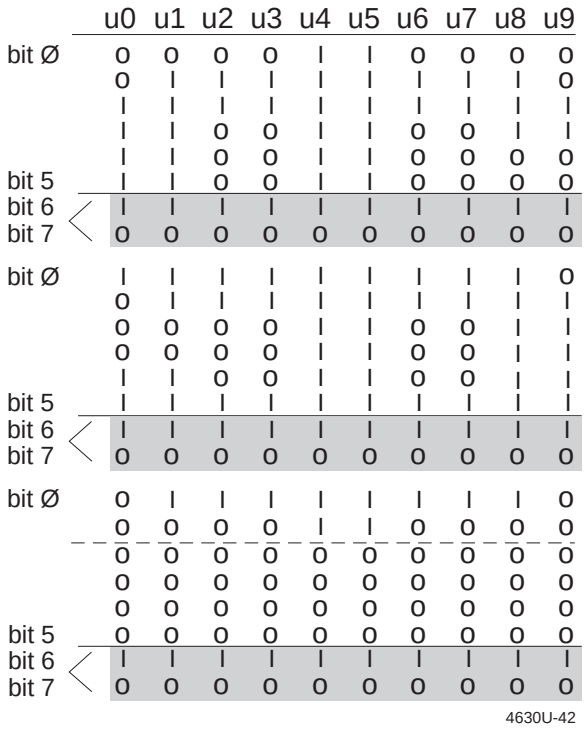
The maximum size for each font character is 4 x 4 inches (1600 x 1600 dots). It is possible to define up to 100 characters.

To download a six bits per byte format

1. Draw the character on graph paper.
2. Change the graph paper drawing into a pattern of ones and zeros.

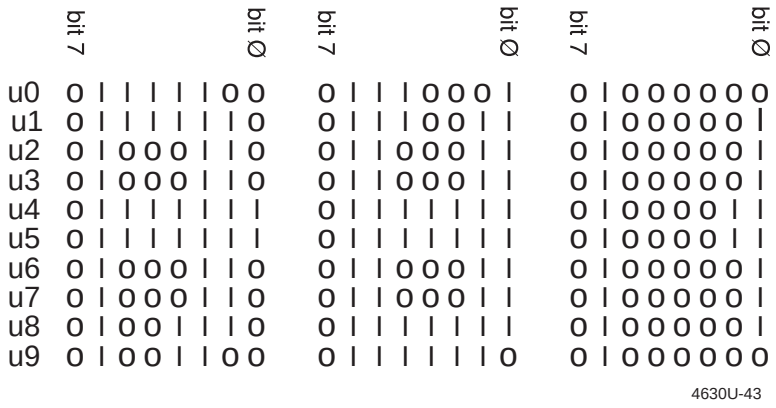


3. Starting with the first column, divide each vertical column into groups of six digits. (If the bottom group has less than six digits, add zeros to this group until it also has six.) The six digits in each group are the six bits that you download in a byte of data. The top digit of each group is bit 0, and the bottom digit is bit 5.



4. Add a 1 in the bit 6 position, and then add a 0 in the bit 7 position so that each group now has eight digits. Eight digits complete the byte.
5. Starting with the first group of eight bits in the first column (u0), reverse the order of each group so that bit 0 is now last and bit 7 is first. Work from the top of each column to the bottom. Each eight-digit group is now a binary representation of an ASCII character.

   Note: *In this illustration, each row now represents a column.*



6. Translate each eight-digit group into an ASCII character according to the full ASCII chart in Appendix A, "Printer Reference:"

   u0 = |q@
   u1 = ~sA
   u2 = FcA
   u3 = FcA
   u4 = <DEL><DEL>C
   u5 = <DEL><DEL>C
   u6 = FcA
   u7 = FcA
   u8 = N<DEL>A
   u9 = L~@

7. Download the font so that you represent each column with a command string.

Here are the previously defined characters shown in a six bits per byte format with ASCII characters.

Commands	Definitions
<ESC>P;<ETX>	Enters Program mode
<STX>T11,FONT11<ETX>	Create bitmap font 11
<STX>x10;y14;<ETX>	Define cell width (10) and cell height (14)
<STX>t36;Z12;<ETX>	Create ASCII character 36 ($), define character width as 12
<STX>u0,|q@;<ETX>	Define column 0
<STX>u1,~sA;<ETX>	Define column 1
<STX>u2,FcA;<ETX>	Define column 2
<STX>u3,FcA;<ETX>	Define column 3
<STX>u4,<DEL><DEL>C;<ETX>	Define column 4
<STX>u5,<DEL><DEL>C;<ETX>	Define column 5
<STX>u6,FcA;<ETX>	Define column 6
<STX>u7,FcA;<ETX>	Define column 7
<STX>u8,N<DEL>A;<ETX>	Define column 8
<STX>u9,L~@;<ETX>	Define column 9
<STX>t105;Z4;<ETX>	Create ASCII character 105 (i), define character width as 4
<STX>u0,L<DEL>C;<ETX>	Define column 0
<STX>u1,L<DEL>C;<ETX>	Define column 1
<STX>R;<ETX>	Save and exit to Print mode

Label Format Example

The format example on this page is a complex label designed to demonstrate the different types of data that you can print with your printer. This example contains human-readable fields, a bar code field, line fields, a box field, and the diamond graphic field defined earlier in this chapter.

To use the graphic for this example, you can download the six bits per byte diamond graphic explained in “Creating User-Defined Graphics” earlier in this chapter.

Complex Label

Label Format

```
<STX><ESC>C1<ETX>

<STX><ESC>P<ETX>

<STX>E1;F1;<ETX>

<STX>H0;o980,180;f3;c26;h28;w20;d3,Diamond Corp.;<ETX>

<STX>U1;o950,40;c2;h6;w6;f3;<ETX>

<STX>H2;o826,76;f3;c36,4;h1;w1;d3,25cm White Tubing;<ETX>

<STX>H3;o700,40;f3;c25;h8;w8;d3,Part 009140001;<ETX>

<STX>H4;o700,568;f3;c25;h8;w8;d3,Bin 462;<ETX>

<STX>H5;o666,40;f3;c25;h8;w8;d3,Vendor 9578;<ETX>

<STX>H6;o666,568;f3;c25;h8;w8;d3,Date 8.8.95;<ETX>

<STX>W7;o704,36;w8;l110;h750;<ETX>
```

```
<STX>B8;o616,72;f3;c12,6,1,0;w4;h12;d3,Diamond Corp.*25cm White Tubing*Part
00914001*Bin 462*Inspector GLP*Price #3.10;<ETX>

<STX>E2;F2;<ETX>

<STX>H9;o254,54;f3;c25;h20;w20;d3,#3.10;<ETX>

<STX>E3;F3;<ETX>

<STX>H10;o240,402;f3;c25;h16;w13;d3,Inspected by:;<ETX>

<STX>H11;o166,474;f3;c25;h22;w22;d3,GLP;<ETX>

<STX>E4;F4;<ETX>

<STX>H12;o116,44;f3;c25;h8;w8;f3;d3,Part 009140001;<ETX>

<STX>H13;o78,44;f3;c25;h8;w8;f3;d3,Bin 462;<ETX>

<STX>H14;o42,44;f3;c25;h8;w8;f3;d3,Vendor 9578<ETX>

<STX>E5;F5;<ETX>

<STX>B15;o434,72;f3;c12,6,1,0;w4;h12;d3,Diamond Corp.*25cm White Tubing*Part
00914001*Bin 462*Inspector GLP*Price #3.10;<ETX>

<STX>s1;S1<ETX>

<STX>Ma,1;Mb,2;Mc,3;Md,4;Me,5;<ETX>

<STX>R<ETX>
```

Label Data

```
<STX><SI>l4<ESC>G1<ETX>

<STX><ETB><ETX>
```

Use the <ETX> and <STX> characters to mark the beginnings and ends of the command strings. The following table explains the other characters. Most of the printer command lines explained in the following table are those that contain commands previously not discussed in this chapter. Refer to previous examples for clarification of the lines that this example does not explain or see Chapter 6, "Intermec Printer Language Commands," for a further explanation of the command language.

Command	Description
<ESC>P	Selects Program mode.
E1;F1;	Erases anything previously stored as format one and accesses the location for format one.
H0;	Defines field 0 as a human-readable field.
f3;	Rotates field 0 by 270 degrees counterclockwise around the origin.

Command	Description
`o980,180;`	Sets the origin of field 0 at coordinates 980,180.
`c26;`	Sets the font for field 0 to font 26.
`d3,Diamond Corp.;`	Sets the data for field 0 to have the constant value: Diamond Corp.
`h28;`	Sets the height of font 26 to 28 dots.
`w20;`	Sets the width of font 26 to 20 dots.
`U1;`	Defines graphic field 1.
`o950,40;`	Sets the origin for field 1 at 950,40.
`c2;`	Selects graphic 2 to print in graphic field 1.
`h6;`	Sets the height of field 1 to 6 dots.
`w6;`	Sets the width of field 1 to 6 dots.
`f3;`	Rotates field 1 by 270 degrees counterclockwise around the origin.
`W7;`	Defines field 7 as a box field.
`o704,36;`	Sets the origin for box field 7 at 704,36.
`w8;`	Sets the width of box field 7 to 8 dots.
`l110;`	Sets the length of box field 7 to 110 dots.
`h750;`	Sets the height of the box field to 750 dots.
`B8;`	Defines field 8 as a bar code field.
`o616,72;`	Sets the origin of field 8 to 616,72.
`f3;`	Rotates field 8 by 270 degrees counterclockwise around the origin.
`c12,6,1,0;`	Determines that field 8 prints PDF 417 with 6 columns, 1 level of error correction, and truncating disabled (the default).
`w4;`	Sets the width of field 8 to 4 times its actual width.
`h12;`	Sets the height to 12 times its actual height.
`d3, Diamond Corp.*25cm White Tubing*Part 00914001*Bin 462*Inspector GLP*Price #3,10;`	Determines the data that prints in bar code field 8.
`s1;`	Deletes page 1.
`S1`	Creates page 1.
`Ma,1;`	Assigns format 1 to position a (first position).
`Mb,2;`	Assigns format 2 to position b (second position).
`Mc,3;`	Assigns format 3 to position c (third position).

Command	Description
`Md,4;;`	Assigns format 4 to position d (fourth position).
`Me,5;`	Assigns format 5 to position e (fifth position).
`<SI>l4`	Selects French as the printer language.
`<ESC>G1`	Selects page 1 for printing.

6

Intermec Printer Language Commands

This chapter provides a detailed description of the commands in the Intermec printer command set that apply to the 4630 and 4830 printers. All Intermec printers use the same printer command language. When designing label formats or printing labels, refer to this chapter for command reference information. If you are using this command set to design your labels, you may want to refer to Chapter 5 for information on label design.

Command Set Summary

The Intermec Printer Language (IPL) commands that take effect when downloaded to the printer depend on which mode the printer is operating in: Print mode, Program mode, or Test and Service mode. When the printer is in any of these modes, it responds to the commands specific to that mode only. As described in the previous chapter, Print mode commands are used to print labels and download data, configuration commands are used to enable or disable printer features and options, and Program mode commands are used for label format design.

Following the command descriptions and accompanying tables are the functional boundaries of the printer within which you need to define the boundaries of your labels.

Note: *If you are using the parallel interface, you will not receive a response from the printer for Print mode and Test and Service mode commands that transmit data. Currently, the parallel interface is a one way (host-to-printer) interface. Refer to the Appendix for more information.*

Listing IPL Commands by Name

The following table lists a summary of all commands available in the Intermec printer command set. Each command is described in detail later in this chapter.

Command	Syntax	Default	Mode	Page #
Abort Print Job	<EM>		Immediate	6-19
Alphanumeric Field Separator	<GS>		Print	6-21
Auto-Transmit 1, Enable	<ESC>j		Configuration	6-30
Auto-Transmit 2, Enable	<ESC>d		Configuration	6-30
Auto-Transmit 3, Enable	<ESC>e		Configuration	6-31
Auto-Transmit 1, 2, and 3, Disable	<ESC>k		Configuration	6-31
Bar Code, Select Type	c	0	Program	6-38
Bar Code Field, Create / Edit	B	0	Program	6-50
Batch Count, Set	<US>	1	Print	6-22
Bitmap Cell Height for Graphic or UDF, Define	y	1	Program	6-51
Bitmap Cell Width for Graphic or UDF, Define	x	1 or 10	Program	6-51
Bitmap User-Defined Font, Clear / Create	T		Program	6-52
Border Around Human-Readable Text, Define	b	0	Program	6-52
Box Field, Create / Edit	W	0	Program	6-52
Character Origin Offset, Define	X	0	Program	6-53
Character Rotation or Bar Code Ratio, Define	r	0	Program	6-53
Clear All Data	<CAN>		Print	6-22
Clear Data From Current Field	<DEL>		Print	6-22
Code 39 Prefix Character, Define	p		Program	6-53
Command Tables, Load	C		Program	6-54
Command Terminator 1	<NUL>		Print	6-22
Command Terminator 2	<LF>		Print	6-22
Configuration Parameters, Transmit	<ESC>p		Print	6-23
Control Panel Access Permission, Set	<SI>A	0	Configuration	6-31
Current Edit Session, Save	N		Program	6-54
Cut	<SO>		Print	6-23
Cutter, Enable / Disable	<SI>c	0	Configuration	6-31
Dark Adjust, Set	<SI>d	0	Configuration	6-32
Data Shift - International Characters	<SUB>		Print	6-23

Command	Syntax	Default	Mode	Page #
End-of-Print Skip Distance, Set	<SI>D	94	Configuration	6-32
Error Code, Request	<BEL>		Immediate	6-19
Field, Delete	D		Program	6-54
Field, Select	<ESC>F	0	Print	6-23
Field Data, Define Source	d		Program	6-55
Field Decrement, Set	<ESC>D	1	Print	6-24
Field Direction, Define	f	0	Program	6-55
Field Increment, Set	<ESC>I	1	Print	6-24
Field Origin, Define	o	0,0	Program	6-56
First Data Entry Field, Select	<ACK>		Print	6-24
Font, Select Type	c	0	Program	6-56
Font, Transmit	<ESC>v		Print	6-24
Font Character Width, Define	Z	cell	Program	6-56
Form Feed	<FF>		Print	6-25
Format, Create/Edit	A or F		Program	6-57
Format Direction in a Page, Define	q	0	Program	6-57
Format, Erase	E		Program	6-57
Format, Select	<ESC>E	0	Print	6-25
Format, Transmit	<ESC>x		Print	6-25
Format Offset Within a Page, Define	O	0,0	Program	6-57
Format Page Position, Assign	M	a	Program	6-58
Format Page Position, Define Data Source	e	0,a,0	Program	6-58
Format Page Position, Delete	m	a	Program	6-58
Graphic, Select Type	c	0	Program	6-59
Graphic or UDC, Define	u		Program	6-59
Height Magnification, Define	h	50,100,2	Program	6-59
Human-Readable Field, Create/Edit	H	0	Program	6-60
IBM Language Translation, Enable/Disable	<SI>i	0	Configuration	6-32
Increment/Decrement, Disable	<ESC>N		Print	6-25
Intercharacter Delay, Set	<SYN>	0	Configuration	6-33
Intercharacter Space for UDF, Define	z	2	Program	6-60
Interpretive Field, Edit	I		Program	6-61

Command	Syntax	Default	Mode	Page #
Interpretive Field, Enable / Disable	i	0	Program	6-61
Label and Gap Length, Transmit	<ESC>L		Immediate	6-19
Label Path Open Sensor Value, Transmit	L		Test / Service	6-66
Label Rest Point, Adjust	<SI>f	0	Configuration	6-33
Label Retract, Enable / Disable	<SI>R	1	Configuration	6-33
Label Retract Distance, Set	<SI>r	217	Configuration	6-34
Label Stock Type, Select	<SI>T	1	Configuration	6-34
Label Taken Sensor Value, Transmit	T		Test / Service	6-66
Length of Line or Box Field, Define	l	100	Program	6-61
Line Field, Create / Edit	L	0	Program	6-62
Maximum Label Length, Set	<SI>L	1000	Configuration	6-34
Memory Usage, Transmit	<ESC>m		Print	6-26
Message Delay, Set	<ESC><SYN>	0	Configuration	6-34
Next Data Entry Field, Select	<CR>		Print	6-26
Numeric Field Separator	<FS>		Print	6-26
Online / Offline on Power Up	<SI>O	0	Configuration	6-35
Options Selected, Transmit	<ESC>O		Print	6-26
Outline Font Description, Download	j		Program	6-62
Outline User-Defined Font, Download	J		Program	6-63
Page, Create / Edit	S		Program	6-63
Page, Delete	s		Program	6-63
Page, Select	<ESC>G	0	Print	6-27
Page, Transmit	<ESC>y		Print	6-27
Pitch Label, Print	C		Test / Service	6-66
Pitch Size, Set	g	12	Program	6-63
Point Size, Set	k	12	Program	6-64
Postamble, Set	<EOT>	NUL	Configuration	6-35
Preamble, Set	<SOH>	NUL	Configuration	6-35
Print	<ETB>		Print	6-27
Print Speed, Set	<SI>S	30	Configuration	6-35
Printer Configuration, Reset	D		Test / Service	6-66
Printer Language, Select	<SI>l	0	Configuration	6-36

Command	Syntax	Default	Mode	Page #
Printhead Parameters, Transmit	<ESC>H		Print	6-27
Printhead Temperature Sensor Value, Transmit	P		Test / Service	6-66
Printhead Test Parameters, Set	<SI>U		Configuration	6-27
Program Mode, Enter	<ESC>P		Print	6-27
Program Mode, Exit	R		Program	6-64
Program Number, Transmit	<ESC>M		Print	6-28
Quantity Count, Set	<RS>	1	Print	6-28
Quality Label, Print	Q		Test / Service	6-66
Reflective Sensor Value, Transmit	M		Test / Service	6-66
Remaining Quantity and Batch Count, Transmit	<ESC>Q		Immediate	6-20
Reset	<DLE>		Immediate	6-20
Self-Strip, Enable / Disable	<SI>t	0	Configuration	6-36
Start / Stop Characters, Print	<ESC><SP>		Print	6-28
Status Dump	<VT>		Immediate	6-20
Status Enquiry	<ENQ>		Immediate	6-20
Test and Service Mode, Enter	<ESC>T		Print	6-28
Test and Service Mode, Exit	R		Test / Service	6-66
Top of Form, Set	<SI>F		Configuration	6-36
Transmissive Sensor Value, Transmit	G		Test / Service	6-66
TTR / Direct Thermal Media Grade, Select	<SI>g	0	Configuration	6-37
User-Defined Character, Clear / Create	G		Program	6-64
User-Defined Character Field, Create / Edit	U	0	Program	6-64
User-Defined Characters, Transmit	<ESC>u	0	Print	6-28
User-Defined Font Character, Create	t		Program	6-65
User-Defined Tables, Transmit	<ESC>Z		Print	6-29
Warm Boot	<BS>		Print	6-29
Width Magnification, Define	w	2	Program	6-65

Listing IPL Commands by Command Syntax

Syntax	Command	Default	Mode	Page #
A	Format, Create/Edit		Program	6-57
B	Bar Code Field, Create/Edit	0	Program	6-50
b	Border Around Human-Readable Text, Define	0	Program	6-52
C	Command Tables, Load		Program	6-54
C	Pitch Label, Print		Test/Service	6-66
c	Bar Code, Select Type	0	Program	6-38
c	Font, Select Type	0	Program	6-56
c	Graphic, Select Type	0	Program	6-59
D	Field, Delete		Program	6-54
D	Printer Configuration, Reset		Test/Service	6-66
d	Field Data, Define Source		Program	6-55
E	Format, Erase		Program	6-57
e	Format Page Position, Define Data Source	0,a,0	Program	6-58
F	Format, Create/Edit		Program	6-57
f	Field Direction, Define	0	Program	6-55
G	User-Defined Character, Clear/Create		Program	6-64
G	Transmissive Sensor Value, Transmit		Test/Service	6-66
g	Pitch Size, Set	12	Program	6-63
H	Human-Readable Field, Create/Edit	0	Program	6-60
h	Height Magnification, Define	50,100,2	Program	6-59
I	Interpretive Field, Edit		Program	6-61
i	Interpretive Field, Enable/Disable	0	Program	6-61
J	Outline User-Defined Font, Download		Program	6-63
j	Outline Font Description, Download		Program	6-62
k	Point Size, Set	12	Program	6-64
L	Line Field, Create/Edit	0	Program	6-62
L	Label Path Open Sensor Value, Transmit		Test/Service	6-66
l	Length of Line or Box Field, Define	100	Program	6-61
M	Format Page Position, Assign	a	Program	6-58
M	Reflective Sensor Value, Transmit		Test/Service	6-66

Syntax	Command	Default	Mode	Page #
m	Format Page Position, Delete	a	Program	6-58
N	Current Edit Session, Save		Program	6-54
O	Format Offset Within a Page, Define	0,0	Program	6-57
o	Field Origin, Define	0,0	Program	6-56
P	Printhead Temperature Sensor Value, Transmit		Test / Service	6-66
p	Code 39 Prefix Character, Define		Program	6-53
Q	Print Quality Label, Print		Test / Service	6-66
q	Format Direction in a Page, Define	0	Program	6-57
R	Program Mode, Exit		Program	6-64
R	Test and Service Mode, Exit		Test / Service	6-66
r	Character Rotation or Bar Code Ratio, Define	0	Program	6-53
S	Page, Create / Edit		Program	6-63
s	Page, Delete		Program	6-63
T	Bitmap User-Defined Font, Clear / Create		Program	6-52
T	Label Taken Sensor Value, Transmit		Test / Service	6-66
t	User-Defined Font Character, Create		Program	6-65
U	User-Defined Character Field, Create / Edit	0	Program	6-64
u	Graphic or UDC, Define		Program	6-59
W	Box Field, Create / Edit	0	Program	6-52
w	Width Magnification, Define	2	Program	6-65
X	Character Origin Offset, Define	0	Program	6-53
x	Bitmap Cell Width for Graphic or UDF, Define	1 or 10	Program	6-51
y	Bitmap Cell Height for Graphic or UDF, Define	1	Program	6-51
Z	Font Character Width, Define	cell	Program	6-56
z	Intercharacter Space for UDF, Define	2	Program	6-60
<ACK>	First Data Entry Field, Select		Print	6-24
<BEL>	Error Code, Request		Immediate	6-19
<BS>	Warm Boot		Print	6-29
<CAN>	Clear All Data		Print	6-22
<CR>	Next Data Entry Field, Select		Print	6-26
<DEL>	Clear Data From Current Field		Print	6-22
<DLE>	Reset		Immediate	6-20

Syntax	Command	Default	Mode	Page #
<EM>	Abort Print Job		Immediate	6-19
<ENQ>	Status Enquiry		Immediate	6-20
<EOT>	Postamble, Set	NUL	Configuration	6-35
<ESC><SP>	Start / Stop Characters, Print		Print	6-28
<ESC><SYN>	Message Delay, Set	0	Configuration	6-34
<ESC>D	Field Decrement, Set	1	Print	6-24
<ESC>d	Auto-Transmit 2, Enable		Configuration	6-30
<ESC>E	Format, Select	0	Print	6-25
<ESC>e	Auto-Transmit 3, Enable		Configuration	6-31
<ESC>F	Field, Select	0	Print	6-23
<ESC>G	Page, Select	0	Print	6-27
<ESC>H	Printhead Parameters, Transmit		Print	6-27
<ESC>I	Field Increment, Set	1	Print	6-24
<ESC>j	Auto-Transmit 1, Enable		Configuration	6-30
<ESC>k	Auto-Transmit 1, 2, and 3, Disable		Configuration	6-31
<ESC>L	Label and Gap Length, Transmit		Immediate	6-19
<ESC>M	Program Number, Transmit		Print	6-28
<ESC>m	Memory Usage, Transmit		Print	6-26
<ESC>N	Increment / Decrement, Disable		Print	6-25
<ESC>O	Options Selected, Transmit		Print	6-26
<ESC>P	Program Mode, Enter		Print	6-27
<ESC>p	Configuration Parameters, Transmit		Print	6-23
<ESC>Q	Remaining Quality and Batch Counts, Transmit		Immediate	6-20
<ESC>T	Test and Service Mode, Enter		Print	6-28
<ESC>u	User-Defined Characters, Transmit	0	Print	6-28
<ESC>v	Font, Transmit		Print	6-24
<ESC>x	Format, Transmit		Print	6-25
<ESC>y	Page, Transmit		Print	6-27
<ESC>Z	User-Defined Tables, Transmit		Print	6-29
<ETB>	Print		Print	6-27
<FF>	Form Feed		Print	6-25
<FS>	Numeric Field Separator		Print	6-26

Syntax	Command	Default	Mode	Page #
<GS>	Alphanumeric Field Separator		Print	6-21
<LF>	Command Terminator 2		Print	6-22
<NUL>	Command Terminator 1		Print	6-22
<RS>	Quantity Count, Set	1	Print	6-28
<SI>A	Control Panel Access Permission, Set	0	Configuration	6-31
<SI>c	Cutter, Enable / Disable	0	Configuration	6-31
<SI>D	End-of-Print Skip Distance, Set	94	Configuration	6-32
<SI>d	Dark Adjust, Set	0	Configuration	6-32
<SI>F	Top of Form, Set		Configuration	6-36
<SI>f	Label Rest Point, Adjust	0	Configuration	6-33
<SI>g	TTR / Direct Thermal Media Grade, Select	0	Configuration	6-37
<SI>i	IBM Language Translation, Enable / Disable	0	Configuration	6-32
<SI>L	Maximum Label Length, Set	1000	Configuration	6-34
<SI>l	Printer Language, Select	0	Configuration	6-36
<SI>O	Online / Offline on Power Up	0	Configuration	6-35
<SI>R	Label Retract, Enable / Disable	1	Configuration	6-33
<SI>r	Label Retract Distance, Set	217	Configuration	6-34
<SI>S	Print Speed, Set	30	Configuration	6-35
<SI>T	Label Stock Type, Select	1	Configuration	6-34
<SI>t	Self-Strip, Enable / Disable	0	Configuration	6-36
<SI>U	Printhead Test Parameters, Set		Configuration	6-27
<SO>	Cut		Print	6-23
<SOH>	Preamble, Set	NUL	Configuration	6-35
<SUB>	Data Shift - International Characters		Print	6-23
<SYN>	Intercharacter Delay, Set	0	Configuration	6-33
<US>	Batch Count, Set	1	Print	6-22
<VT>	Status Dump		Immediate	6-20

Listing Printer Commands by Function

Immediate Commands

System Commands		Page #
<BEL>	Error Code, Request	6-19
<DLE>	Reset	6-20
<EM>	Abort Print Job	6-19
<ENQ>	Status Enquiry	6-20
<VT>	Status Dump	6-20

Program Mode Commands

Bar Code Field Editing Commands		Page #
c	Bar Code, Select Type	6-38
d	Field Data, Define Source	6-55
f	Field Direction, Define	6-55
h	Height Magnification, Define	6-59
i	Field Interpretive, Enable/Disable	6-61
o	Field Origin, Define	6-56
p	Code 39 Prefix Character, Define	6-53
r	Character Rotation or Bar Code Ratio, Define	6-53
w	Width Magnification, Define	6-65

Bitmap User-Defined Field Editing Commands		
t	User-Defined Font Character, Define	6-65
u	Graphic or UDC, Define	6-59
x	Bitmap Cell Width for Graphic or UDF, Define	6-51
X	Character Origin Offset, Define	6-53
y	Bitmap Cell Height for Graphic or UDF, Define	6-51
Z	Font Character Width, Define	6-56
z	Intercharacter Space or UDF, Define	6-60

Box Field Editing Commands		Page #
f	Field Direction, Define	6-55
h	Height Magnification, Define	6-59
l	Length of Line or Box Field, Define	6-61
o	Field Origin, Define	6-56
w	Width Magnification, Define	6-65

Format Editing Commands		
B	Bar Code Field, Create/Edit	6-50
D	Field, Delete	6-54
H	Human-Readable Field, Create/Edit	6-60
I	Interpretive Field, Edit	6-61
L	Line Field, Create/Edit	6-62
U	User-Defined Character Field, Create/Edit	6-64
W	Box Field, Create/Edit	6-52

Human-Readable Field Editing Commands		
b	Border Around Human Readable Text, Define	6-52
c	Font Type, Select	6-56
d	Field Data, Define Source	6-55
f	Field Direction, Define	6-55
g	Pitch Size, Set	6-63
h	Height Magnification, Define	6-59
k	Point size, Set	6-64
o	Field Origin, Define	6-56
r	Character Rotation or Bar Code Ratio, Define	6-53
w	Width Magnification, Define	6-65

Interpretive Field Editing Commands		Page #
b	Border Around Human Readable Text, Define	6-52
c	Font, Select Type	6-56
f	Field Direction, Define	6-55
g	Pitch Size, Set	6-63
h	Height Magnification, Define	6-59
k	Point size, Set	6-64
o	Field Origin, Define	6-56
r	Character Rotation or Bar Code Ratio, Define	6-53
w	Width Magnification, Define	6-65

Line Field Editing Commands		
f	Field Direction, Define	6-55
l	Length of Line or Box Field, Define	6-61
o	Field Origin, Define	6-56
w	Width Magnification, Define	6-65

Outline UDF Editing Commands		
j	Outline Font Description, Download	6-62
x	Bitmap Cell Width for Graphic or UDF, Define	6-51
y	Bitmap Cell Height for Graphic or UDF, Define	6-51

Page Editing Commands		
e	Format Page Position, Define Data Source	6-58
m	Format Page Position, Delete	6-58
M	Format Page Position, Assign	6-58
O	Format Offset Within a Page, Define	6-57
q	Format Direction in a Page, Define	6-57

Programming Commands		Page #
A	Format, Create/Edit	6-57
E	Format, Erase	6-57
F	Format, Create/Edit	6-57
G	User-Defined Character, Clear/Create	6-64
J	Outline User-Defined Font, Download	6-63
N	Current Edit Session, Save	6-54
R	Program Mode, Exit	6-64
S	Page, Create/Edit	6-63
s	Page, Delete	6-63
T	Bitmap User-Defined Font, Clear/Create	6-52

UDC Editing Commands		
u	Graphic or UDC, Define	6-59
x	Bitmap Cell Width for Graphic or UDF, Define	6-51
y	Bitmap Cell Height for Graphic or UDF, Define	6-51

UDC Field Editing Commands		
c	Graphic Type, Select	6-59
f	Field Direction, Define	6-55
h	Height Magnification, Define	6-59
o	Field Origin, Define	6-56
w	Width Magnification, Define	6-65

Print Mode Commands

Configuration Commands		Page #
<SI>A	Control Panel Access Permission, Set	6-31
<SI>c	Cutter, Enable / Disable*	6-31
<SI>D	End-of-Print Skip Distance, Set	6-32
<SI>d	Dark Adjust, Set	6-32
<SI>F	Top of Form, Set	6-36
<SI>f	Label Rest Point, Adjust	6-33
<SI>g	TTR / Direct Thermal Media Grade, Select	6-37
<SI>L	Maximum Label Length, Set*	6-34
<SI>l	Printer Language, Select	6-36
<SI>O	Online / Offline on Power Up*	6-35
<SI>R	Label Retract, Enable / Disable*	6-33
<SI>r	Label Retract Distance, Set	6-34
<SI>S	Print Speed, Set	6-35
<SI>T	Label Stock Type, Select*	6-34
<SI>t	Self-Strip, Enable / Disable*	6-36
D	Reset Memory to Default (Test and Service Command)	6-66

* *After enabling these commands, you need to reset the printer or cycle its power.*

Print Commands		Page #
<ACK>	First Data Entry Field, Select	6-24
<CAN>	Clear All Data	6-22
<CR>	Next Data Entry Field, Select	6-26
<DEL>	Clear Data From Current Field	6-22
<ESC><SP>	Start / Stop Characters, Print	6-28
<ESC>D	Field Decrement, Set	6-24
<ESC>E	Format, Select	6-25
<ESC>F	Field, Select	6-23
<ESC>G	Page, Select	6-27
<ESC>I	Field Increment, Set	6-24
<ESC>N	Increment / Decrement, Disable	6-25

Print Commands		**Page #**
<ESC>P	Program Mode, Enter	6-27
<ESC>T	Test and Service Mode, Enter	6-28
<ETB>	Print	6-27
<FF>	Form Feed	6-25
<FS>	Numeric Field Separator	6-26
<GS>	Alphanumeric Field Separator	6-21
<RS>	Quantity Count, Set	6-28
<SUB>	Data Shift - International Characters	6-23
<US>	Batch Count, Set	6-22

Protocol Modification Commands		
<EOT>	Postamble, Set	6-35
<ESC><SYN>	Message Delay, Set	6-34
<ESC>d	Autotransmit 2, Enable	6-30
<ESC>e	Autotransmit 3, Enable	6-31
<ESC>j	Autotransmit 1, Enable	6-30
<ESC>k	Autotransmit 1, 2, and 3, Disable	6-31
<SOH>	Preamble, Set	6-35
<SYN>	Intercharacter Delay, Set	6-33
C	Command Tables, Load	6-54

Test and Service Commands		**Page #**
D	Reset Memory to Default	6-66
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Immediate Commands

The following command set is effective in any of the operational modes of the 4630 or 4830 printer. Use the commands in this set to query the printer for status and print job information. Unlike other commands that the printer stores in the data buffer and executes in the order received, the printer executes immediate commands when it receives them, regardless of printer mode.

Abort Print Job

Purpose: Stops batch printing.

Syntax: <EM>

Notes: The printer sets the remaining quantity and batch counts to 1. Other commands remaining in the buffer will continue to be executed.

Error Code, Request

Purpose: Solicits error codes from the printer.

Syntax: <BEL>

Notes: The most recent error code is sent back in the form of an ASCII number. The error code represents a command syntax error or a printer RAM usage error. If no errors have occurred since powering on the printer, the printer sends a zero.

Label and Gap Length, Transmit

Purpose: Transmits the label and gap length as measured by the number of 5 mil increments.

Syntax: <ESC>L

Notes: Label length refers to the length of the label currently being processed. If the label is longer than the distance between the label sensor and the printhead, the printer transmits the length of the previous label.

If continuous stock is selected, the printer transmits the length defined by the <SI>L command (default is 1000). The gap length is 0.

Remaining Quantity and Batch Counts, Transmit

Purpose: Uploads the remaining quantity and batch counts for the current print job.

Syntax: <ESC>Q

Reset

Purpose: Executes a printer power up reset immediately.

Syntax: <DLE>

Notes: All data and commands in the input buffer are erased.

Status Dump

Purpose: Causes the printer to upload all current printer status.

Syntax: <VT>

The printer status is uploaded in the following order (top to bottom, from left):

<GS>	Buffer already full	<BS>	Takeup reel full
<US>	Paper path open	<FS>	Label at strip pin
<US>	Ribbon fault	<DC1>	Skipping
<EM>	No label stock	<DC1>	Printing
<DC3>	Buffer now full	<DC1>	Ready

Status Enquiry

Purpose: Transmits the current printer status to the host.

Syntax: <ENQ>

Notes: If more than one status is true, the printer transmits the status with the highest priority (top to bottom, from left):

<GS>	Buffer already full	<BS>	Takeup reel full
<US>	Paper path open	<FS>	Label at strip pin
<US>	Ribbon fault	<DC1>	Skipping
<EM>	No label stock	<DC1>	Printing
<DC3>	Buffer now full	<DC1>	Ready

Print Mode Commands

The printer must be in Print mode to

- pass data to formats.
- print labels.
- change the printer configuration.

When you enter data into a format for printing, the printer uses a field pointer to designate the field in the format where the data should print. If a new format is chosen, the field pointer automatically points to the lowest numbered data entry field and will continue to point to that field unless a different field or format is selected. If a selected field already contains data, it will be overwritten by the new data. If the pointer is pointing to the same field that just accepted data, the new data will be concatenated to the previously entered data.

You can send Print mode commands through the methods described in Chapter 5. The command string to enter Print mode from Program mode or Test and Service mode is:

```
<STX>R<ETX>
```

Note: *Each string of commands must be preceded by the start of message character <STX>, and followed by the end of message character <ETX>. All Print mode commands are terminated by the next command in the message. The command separator (<NUL> or <LF>) is optional between commands, but is necessary to separate commands from data.*

The following command descriptions explain the print commands that are effective when the printer is in Print mode. The commands are listed in alphabetical order according to the command description.

Alphanumeric Field Separator

Purpose: Marks regions of alphanumeric characters to increment or decrement.

Syntax: `<GS>`

Example: `PART <GS>001<GS>`

`001` the region to be incremented.
`<GS>` marks the region and does not appear on the label.

Alphanumeric characters are 0 to 9 and A to Z. The order of alphanumeric characters is: 0, 1, 2...7, 8, 9, A, B, C...X, Y, Z, 0, 1, 2...7, 8, 9, A, B, C...

Notes: You may have more than one region in a field as long as they do not overlap and they are incremented or decremented independent of each other. Increment and decrement regions cannot overlap. If there are any non-alphanumeric characters within this region, they are ignored.

Batch Count, Set

Purpose: Sets the number of labels to be printed in the next batch.

Syntax: <US>*n*

The range for *n* is from 1 to 9999.

Default: *n* = 1

Notes: An error code (21) is generated if *n* is out of range.

Clear All Data

Purpose: Clears all host-entered data from the current page or format.

Syntax: <CAN>

Notes: If no page is selected, the pointer indicates the first data entry field in the format after the data is cleared. If a page is selected, the pointer designates the first data entry field in the first format.

Clear Data From Current Field

Purpose: Deletes data from the current field.

Syntax: <DEL>

Notes: The field pointer continues to designate the current field even after the data is cleared.

Command Terminator 1

Purpose: Terminates the current command.

Syntax: <NUL>

Command Terminator 2

Purpose: Terminates the current command.

Syntax: <LF>

Configuration Parameters, Transmit

Purpose: Uploads the current configuration commands from the printer.

Syntax: <ESC>p

Notes: Only the configuration parameters that can be set from the host are received. Use this command to view, edit, or copy the current configuration command settings.

Cut

Purpose: Advances the label out to the cutter and cuts the label stock.

Syntax: <SO>

Notes: This command is only executed if the cutter is installed but not enabled.

Data Shift – International Characters

Purpose: Allows command characters to be entered as data.

Syntax: <SUB>

Notes: An error code is generated if no character follows this command.

Field, Select

Purpose: Selects a data field for entering or working with data.

Syntax: <ESC>F*n* or <ESC>F["*name*"]

n can range from 0 to 199.

Default: *n* = 0

Notes: The parameter for this command may be either the field number *or* the field name. It cannot be both. If neither are present, the printer defaults to 0.

If the field number is used, all following data is entered into field *n*. If the field name is used, all following data is entered into all fields with that name in the current format or page. The field name must be bracketed by quotation marks (" ").

An error code (33) is generated if an invalid field number is entered.

Field Decrement, Set

Purpose: Sets the field decrement value for the current field.

Syntax: <ESC>D*n*

The range for *n* is from 1 to 9999. Field decrement values in data fields are decremented by *n* after each print.

Default: *n* = 1

Notes: An error code (22) is generated if the decrement value is out of range.

Field Increment, Set

Purpose: Sets the increment value for the selected field.

Syntax: <ESC>I*n*

The range for *n* is from 1 to 9999. Field increment values in data entry fields are incremented by *n* after each print.

Default: *n* = 1

Notes: An error code is generated if the increment value is out of range.

First Data Entry Field, Select

Purpose: Sets the field pointer to the lowest numbered data entry field in that format.

Syntax: <ACK>

Notes: This command ensures that data will print in the field with the lowest number if you do not want to specify a data field by its field number.

Font, Transmit

Purpose: Uploads a font from the printer in the form of commands and data the printer receives to create the font.

Syntax: <ESC>v*n*

n is the font ID number and can range from 0 to 41.

Form Feed

Purpose: Feeds a label out to the next print point.

Syntax: <FF>

Notes: For Self-Strip operation, the printer feeds one blank label to the Self-Strip bar, skipping an entire label.

For batch operation with die cut label stock, the label moves to the tear bar.

For continuous label stock, the label will move the end-of-print skip distance.

Format, Select

Purpose: Selects a format for data entry or printing.

Syntax: <ESC>E*n*

To select an individual format, *n* is a numeric format ID ranging from 0 to 19.

To select a format within a page, *n* is an alphabetic format position within the page ranging from a to z.

Default: *n* = 0

Notes: After the format is selected, the field pointer points to the lowest numbered data entry field. All host entered / variable data will be cleared form this format.

An error code is generated if an invalid format number is entered.

Format, Transmit

Purpose: Uploads a format from the printer in the form of commands and data the printer uses to create the format.

Syntax: <ESC>x*n*

n is the format ID number and can range from 0 to 19.

Increment/Decrement, Disable

Purpose: Resets any increment or decrement flags for the current field.

Syntax: <ESC>N

Memory Usage, Transmit

Purpose: Uploads information on RAM usage.

Syntax: <ESC>m

The amounts are measured in kilobytes.

Notes: The printer uploads the amount of total storage memory and the amount still available for formats, fonts, and UDCs in the form: *xxx,yyy*. For example, 128, 96 indicates that the printer has a total of 128K of static RAM, of which 96K is still available for use.

Next Data Entry Field, Select

Purpose: Moves the field pointer to the next data entry field.

Syntax: <CR>

Notes: If a page is not selected and the pointer is designating the last field, the field pointer moves back to the first data entry field in the format.

If a multiformat page is selected and the field pointer is pointing to the last field in a format, it moves to the first field in the next format.

Numeric Field Separator

Purpose: Specifies which numeric data within a field to increment or decrement.

Syntax: <FS>

Notes: You can have more than one region per field as long as they do not overlap. The fields are incremented or decremented independent of each other. Any non-numeric characters within the region are ignored.

Options Selected, Transmit

Purpose: Uploads the list of selected options.

Syntax: <ESC>O

Options include:
0 No options selected
1 Cutter
2 Media rewind hub
3 Self-Strip assembly
4 Self-Strip

Page, Select

Purpose: Selects a page for data entry or printing.

Syntax: <ESC>G*n*

n can range from 0 to 9.

Default: *n* = 0

Notes: After the page is selected, the field pointer points to the lowest numbered data entry field of the lowest position format. All data will be cleared from this page.

An error code is generated if an invalid field number is entered.

Page, Transmit

Purpose: Uploads a page from the printer in the form of commands used to create a format. It also uploads all formats in a page.

Syntax: <ESC>y*n*

Default: *n* = 1

Print

Purpose: Prints the current page or format with data previously entered.

Syntax: <ETB>

Printhead Parameters, Transmit

Purpose: Transmits the number and size of dots in the printhead back to the host.

Syntax: <ESC>H

Notes: Example: 1918,3.3

Program Mode, Enter

Purpose: Causes the printer to enter Program mode for the purpose of editing pages, formats, fonts, or graphics.

Syntax: <ESC>P

Notes: All previously entered data is lost upon execution of this command.

Program Number, Transmit

Purpose: Transmits both the program number and the version number.

Syntax: <ESC>M

Notes: This command uploads the program and software version number to the host as an ASCII alphanumeric character string.

Example: 012345ver1.4

Quantity Count, Set

Purpose: Sets the quantity of label batches to be printed by the next print command.

Syntax: <RS>*n*

n can range from 1 to 9999.

Default: *n* = 1

Notes: Incrementing and decrementing of data occurs between label batches. An error code is generated if the quantity is out of range.

Start/Stop Characters, Print

Purpose: Instructs the current Code 39 field to print only the start and stop characters.

Syntax: <ESC><SP>

Notes: The printer clears all previous data from the current field.

Test and Service Mode, Enter

Purpose: Enters Test and Service mode.

Syntax: <ESC>T

Notes: Complete all print jobs before executing this command because any data entered prior to the command will be erased.

User-Defined Characters, Transmit

Purpose: Uploads a graphic from the printer in the form of commands and data the printer receives to create the graphic.

Syntax: <ESC>u*n*

n is the graphic ID number and can range from 0 to 99.

User-Defined Tables, Transmit

Purpose: Transmits the commands the printer would receive to download a new command set.

Syntax: <ESC>Z*t*

t is the command table identifier.
t = 0 Print mode commands
t = 1 Escape print commands
t = 2 Shift print commands
t = 3 Status response
t = 4 Protocol characters

Notes: Use this command to substitute protocol and command characters. Refer to "Command Tables" later in this chapter for a listing of default values.

Warm Boot

Purpose: Resets the printer with a warm boot.

Syntax: <BS>

Notes: Unlike the <DLE> command, this command does not take effect immediately. It waits until all previous commands have been executed before it takes effect.

Data sent after this command, or before the printer finishes rebooting, is lost. In XON / XOFF mode, the printer sends back a <DC2>.

This command is useful when changes in configuration settings require a printer reset.

Configuration Commands

Configuration commands, like Print mode commands, are effective when the printer is in Print mode. Use configuration commands to

- set parameters for configuration features.
- enable or disable options.

Configuration commands come into effect when the printer is reset or the power is cycled. If a printer reset is needed, the warm boot command should be used. The reset will take place after all previous commands have been executed. This contrasts with the <DLE> reset command, which executes immediately after it is received even if other commands are waiting to be executed. The command string to enter Print mode from Program mode is:

```
<STX>R<ETX>
```

Note: *Each string of commands must be preceded by the start of message character <STX>, and followed by the end of message character <ETX>. All configuration commands are terminated by the next command in the message.*

The following command descriptions explain the configuration commands that are effective when the printer is in Print mode. The command descriptions are listed in alphabetical order.

Auto-Transmit 1, Enable

Purpose: Enables auto-transmit level 1.

Syntax: `<ESC>j`

Status response codes:

`<DC1>`	Fault cleared
`<FS>`	Label at strip pin
`<BS>`	Takeup reel full
`<EM>`	No label stock
`<US>`	Ribbon fault
`<US>`	Label path open

Notes: The printer automatically transmits the status response codes when necessary.

Auto-Transmit 2, Enable

Purpose: Enables auto-transmit level 2.

Syntax: `<ESC>d`

Notes: The printer automatically transmits the status response code <DC1>.

Auto-Transmit 3, Enable

Purpose: Enables auto-transmit level 3.

Syntax: <ESC>e

Status response codes:
<HT> Imager overrun
<SOH> Printing is done and the buffer is empty
<RS> Insufficient RAM for printing or storage

Notes: The printer automatically transmits the status response codes when necessary.

Auto-Transmit 1, 2, and 3, Disable

Purpose: Disables auto-transmit status.

Syntax: <ESC>k

Control Panel Access Permission, Set

Purpose: Sets a security level to restrict access to certain menus depending on the value of *n*.

Syntax: <SI>A*n*

n = 0 Allows access to all menus (operator, configuration, installation, and test and service).
n = 1 Allows access to operator and configuration menus only.
n = 2 Allows access to the operator menu only.
n = 3 Denies access to all menus.

Default: *n* = 0

Cutter, Enable/Disable

Purpose: Turns the cutter on or off, if a cutter is installed.

Syntax: <SI>c*n*

n = 0 Disables cutter.
n ≠ 0 Enables cutter.

Default: *n* = 0

Notes: This command becomes effective after a printer reset or power up.

Dark Adjust, Set

Purpose: Sets the dark adjust command. This controls the print darkness on the labels.

Syntax: <SI>d*n*

n ranges from -10 to 10.

Default: *n* = 0

Notes: This command changes the configuration setting.

End-of-Print Skip Distance, Set

Purpose: Sets the end-of-print skip distance. This distance is a number measured in 5 mil increments that the label advances after printing. This command works for continuous label stock and for gap and mark label stock at the end of a batch print when label retract is enabled.

Syntax: <SI>D*n*

n must be a number from 16 to 9999 in 5 mil increments.

Default: *n* = 0 Gap and Mark label stock mode.
n = 94 Continuous stock mode.

Notes: To advance the label out to the tear bar in label stock mode, set *n* to 90. If you enter a value for *n*, it applies to both continuous mode and label stock mode, regardless of the mode in which the value was entered.

Entering the <SI>D command without setting any parameters returns the setting to its default value.

IBM Language Translation, Enable/Disable

Purpose: Turns the IBM language translation feature on or off.

Syntax: <SI>i*n*

n = 0 Disable IBM translation.
n = 1 Enable IBM translation.

Default: *n* = 0

Notes: This feature allows IBM compatible characters to replace standard ASCII characters based on the current printer language. This command overrides the language translation that is based on the current printer emulation.

Intercharacter Delay, Set

Purpose: Sets the intercharacter delay equal to *n* in milliseconds. The intercharacter delay is the time delay between characters in a message transmitted by the printer.

Syntax: <SYN>*n*

n must be a number from 0 to 9999, in milliseconds.

Default: *n* = 0

Label Rest Point, Adjust

Purpose: Adjusts the point at which labels are presented for removal. Positions the gap on the tear bar when using form feed. This command is used mostly for Self-Strip and Cutter applications.

Syntax: <SI>f*n*

The range for *n* is from -20 (furthest back) to +20 (furthest forward) in 5 mil increments.

Default: *n* = 0

Label Retract, Enable/Disable

Purpose: Turns the label retract option on or off.

Syntax: <SI>R*n*

n = 0 Disables label retract.
n ≠ 0 Enables label retract.

Default: *n* = 1

Notes: For die-cut label stock, the printer determines the retract distance automatically.

For continuous label stock, the printer uses the retract distance set by the Set Label Retract Distance command. See also Select Label Stock Type command.

This command becomes effective after a printer reset or power up.

Label Retract Distance, Set

Purpose: Sets the label retract distance to *n* in 5 mil increments. This command works with continuous label stock only. The label retracts to this distance at the start of a print.

Syntax: <SI>r*n*

Default: *n* = 217

Label Stock Type, Select

Purpose: Selects the type of label stock.

Syntax: <SI>T*n*

n = 0 Continuous label stock
n = 1 Gap label stock
n = 2 Mark label stock

Default: *n* = 1

Notes: This command becomes effective after a printer reset or power up.

Maximum Label Length, Set

Purpose: Defines the maximum label length as *n* in 5 mil increments. This number is used only for detecting low stock. It is not used to limit the image size of a format on the label.

Syntax: <SI>L*n*

n must be a number from 200 to 4800 in 5 mil increments.

Default: *n* = 1000

Notes: This command becomes effective after a printer reset or power up.

Message Delay, Set

Purpose: Sets the message delay to *n* milliseconds.

Syntax: <ESC><SYN>*n*

n must be a number from 0 to 9999 milliseconds.

Default: *n* = 0

Online/Offline on Power Up

Purpose: Selects the printer to be online or offline when it is turned on.

Syntax: <SI>O*n*

n = 0 Printer is online on power up.
n ≠ 0 Printer is offline on power up.

Default: *n* = 0

Notes: This command becomes effective after a printer reset or power up.

Postamble, Set

Purpose: Sets the postamble character to *n*.

Syntax: <EOT>*n*

n can be any ASCII character. When *n* = <NUL>, no postamble character is sent.

Default: *n* = <NUL>

Preamble, Set

Purpose: Sets the preamble character equal to *n*.

Syntax: <SOH>*n*

n can be any ASCII character. When *n* = <NUL>, no preamble character is sent.

Default: *n* = <NUL>

Print Speed, Set

Purpose: Sets the print speed in inches per second (ips).

Syntax: <SI>S*n*

4630 *n* must be from 20 to 80 (2.0 to 8.0 ips) in multiples of 5.

4830 *n* must be from 20 to 50 (2.0 to 5.0 ips) in multiples of 5.

Default: *n* = 35, 4630

n = 25, 4830

Printer Language, Select

Purpose: Selects the printer language.

Syntax: <SI>l*n*

n can be one of the following values:

0 = USA	4 = France	8 = 256 Characters
1 = UK	5 = Sweden	9 = Switzerland
2 = Germany	6 = Italy	10 = Code Page 850
3 = Denmark	7 = Spain	

Default: *n* = 0

Notes: Only one language is used per print job.

To print 256 Characters or Code Page 850, you must use a parralel interface or configure the host serial port for 8-bits per byte data transmission.

Self-Strip, Enable/Disable

Purpose: Turns the Self-Strip option on or off. The Self-Strip option must first be installed from the control panel.

Syntax: <SI>t*n*

n = 0 Disables the Self-Strip option.
n = 1 Enables the Self-Strip option.

Default: *n* = 0

Notes: This command becomes effective after a printer reset or power up.

Top of Form, Set

Purpose: Sets the top-of-form (left margin) to *n* which is the distance, in 5 mil increments, from the label origin to its leading edge.

Syntax: <SI>F*n*

n must be a number from -10 to 4000 in 5 mil increments. The negative values let you decrease the margin and print closer to the edge of the label.

Default: *n* = 20

TTR/Direct Thermal Media Grade, Select

Purpose: Selects the label stock to be used.

Syntax: <SI>g*n*

n = 0 Direct thermal stock
n = 1 Thermal transfer stock

Default: *n* = 0

Notes: This command becomes effective after a printer reset or power up.

Program Mode Commands

The Program mode commands are used specifically for label format design and to download user-defined fonts and graphics. To set the printer to Program mode, send the following command string:

<STX><ESC>P<ETX>

When creating or editing formats, the printer uses a field pointer to designate the field that is to be modified when the printer is in Program mode. In order to download commands in Program mode, you must specify the field to be changed. If you do not select a field, the pointer will continue to point to the last selected field until a different format or field is selected.

New formats contain a default human-readable field numbered H0. New pages do not contain a default format.

Note: *Each string of commands must be preceded by the start of message character <STX>, and followed by the end of message character <ETX>. The semicolon (;) is the command terminator. All commands in Program mode must end with this terminator except the last command in a message. Parentheses {( )} and <LF> characters are ignored by the printer in Program mode.*

The following command descriptions explain the commands that are effective when the printer is in Program mode. The command descriptions are listed in alphabetical order.

Bar Code, Select Type

Purpose: Selects a symbology for a bar code field.

Syntax: c*n*[,*m1*][,*m2*][,*m3*]

n can range from 0 to 16.

,*m* varies depending on the symbology you select.

Default: *n* = 0

Notes: Modifiers apply only to bar code symbologies. For more information on bar code symbologies, please refer to *The Bar Code Book* by Roger Palmer (Intermec P / N 051241).

Use the following table to find the correct bar code for your format.

Value	Symbology	Value	Symbology
n = 0	Code 39	*n* = 8	HIBC Code 39
n = 1	Code 93	*n* = 9	Code 16K
n = 2	Interleaved 2 of 5	*n* = 10	Code 49
n = 3	Code 2 of 5	*n* = 11	POSTNET
n = 4	Codabar	*n* = 12	PDF417
n = 5	Code 11	*n* = 13	Code One
n = 6	Code 128	*n* = 14	Maxicode
n = 7	UPC/EAN Codes	*n* = 16	HIBC Code 128

The following pages contain detailed descriptions of the different symbologies and the parameters that you can set for each.

Code 39

Syntax: c0[,*m*]

The 4630 and 4830 printers support standard Code 39, full ASCII Code 39, and 43 character Code 39.

If you enter <ESC><SPACE> as data, the start and stop characters are printed.

c0,0 Select Code 39. No check digit.

c0,1 Select Code 39. Printer enters check digit.

c0,2 Select Code 39. Host enters check digit and printer verifies.

c0,3 Select full ASCII Code 39. No check digit.

c0,4 Select full ASCII Code 39. Printer enters check digit.

c0,5 Select full ASCII Code 39. Host enters check digit and printer verifies.

c0,6 Select 43 character Code 39. No check digit.

c0,7 Select 43 character Code 39. Printer enters check digit.

c0,8 Select 43 character Code 39. Host enters check digit and printer verifies.

Default: ,*m* = 0

Code 93

Syntax: c1

Interleaved 2 of 5

Syntax: c2[,*m*]

The printer adds a zero to character strings that are odd in length.

c2,0 Select Interleaved 2 of 5. No check digit.

c2,1 Select Interleaved 2 of 5. Printer enters check digit.

c2,2 Select Interleaved 2 of 5. Printer enters check digit.

Default: ,*m* = 0

Code 2 of 5

Syntax: `c3[,m]`

`c3,0` Select Code 2 of 5. 3-bar start / stop code.

`c3,1` Select Code 2 of 5. 2-bar start / stop code.

Default: ,*m* = 0

Codabar

Syntax: `c4[,m]`

Valid start / stop characters range from A to D and from a to d. You can define them as part of the bar code field or you can download them as part of the print data. Start / stop characters sent down with printer data override the characters defined by the bar code field.

`c4,0` Select Codabar. Host enters start / stop codes and printer verifies.

`c4,1,x,y` Select Codabar. Printer enters start code *x* and stop code *y*. *x* and *y* can range from A to D.

Default: ,*m* = 0

Code 11

Syntax: `c5[,m]`

`c5,0` Select Code 11. Printer enters 2 check digits.

`c5,1` Select Code 11. Printer enters 1 check digit.

`c5,2` Select Code 11. Host enters 2 check digits and printer verifies.

`c5,3` Select Code 11. Host enters 1 check digit and printer verifies.

Default: ,*m* = 0

Code 128

Syntax: c6[,*m1*][,*m2*]

UCC-128 serial shipping container code automatically starts in subset C with a <FNC1>. It is a fixed length version of Code 128 requiring you to enter 19 numeric characters. The printer forces the first two characters to zero.

c6,0,0	Code 128, keep parentheses and spaces.
c6,0,1	Code 128, ignore parentheses and spaces in the bar code but keep parentheses and spaces in the interpretive field.
c6,1,0	Select UCC-128 Serial Shipping Container Code.
c6,1,1	Select UCC-128 Serial Shipping Container Code and keep parentheses and spaces in the interpretive field.

Default: ,*m1* = 0 (Code 128)

,*m2* = 0 (keep parentheses and spaces)

UPC/EAN

Syntax: c7[,*m1*][,*m2*]

c7,0,*m2*	Select UPC/EAN Codes. Printer enters check digit and flag 1 enable.
c7,1,*m2*	Select UPC/EAN Codes. Printer enters check digit and flag 1 disabled.
c7,2,*m2*	Select UPC/EAN Codes. Host enters check digit and printer verifies flag 1 enabled.
c7,3,*m2*	Select UPC/EAN Codes. Host enters check digit and printer verifies. flag 1 disabled.

Use ,*m2* to select the following UPC/EAN codes:

0	variable length	5	UPC Version D1
1	EAN 8	6	UPC Version D2
2	EAN 13	7	UPC Version D3
3	UPC Version A	8	UPC Version D4
4	UPC Version E	9	UPC Version D5

Default: ,*m1* = 0

,*m2* = 0

Notes: The variable length option (,*m2*) selects the UPC/EAN version by the number of characters in the data field. The number of data characters and check characters allowed for each version are:

EAN 8	7 data + 1 check character
EAN 13	12 data + 1 check character
UPC version A	11 data + 1 check character
UPC version E	6 data + 1 check character
UPC version D1	13 data + 1 check character
UPC version D2	18 data + 2 check characters
UPC version D3	22 data + 2 check characters
UPC version D4	25 data + 3 check characters
UPC version D5	29 data + 3 check characters

Use " " to delimit the bar code data from the supplemental data. Data to the right of " " is supplemental data; data to the left is bar code data. You can add the two- or five-digit supplemental data to any version of the UPC/EAN code.

The flag 1 option only applies to EAN 8, EAN 13, and UPC version A. For EAN 13, enabling the flag 1 option prints the first character of the bar code interpretive. For EAN 8 and UPC version A, enabling the flag 1 option moves the first and last character of the bar code interpretive outside of the guard bars.

HIBC Code 39

Syntax: `c8[,m1][,m2]`

The following three modifiers conform to Supplier Standard:

`c8,0`	Select HIBC Code 39. Primary format.
`c8,1`	Select HIBC Code 39. Alternate primary format.
`c8,2,`*m2*	Select HIBC Code 39. Secondary format. The linkage character comes from ,*m2*, which is the field identifier.

The following four modifiers conform to Provider Standard:

`c8,3`	Single format.
`c8,4`	First data format.
`c8,5,`*m2*	Select HIBC Code 39. Second data format. The linkage character comes from ,*m2*, which is the field identifier.
`c8,6`	Select HIBC Code 39. Multiple data format.

Default: ,*m1* = 0

Code 16K

Syntax: c9

Code 49

Syntax: c10

POSTNET

Syntax: c11

Notes: POSTNET uses the height (h) and width (w) commands in the same way as a font. Other symbologies use "h" to specify the bar height and "w" to specify the narrow bar width. POSTNET uses "h" and "w" to magnify the base character cell. Each character cell is 13 dots high by 22 dots wide. The default width and height magnification for POSTNET is 2 x 2, resulting in a symbology sized according to the POSTNET specification.

PDF417

Syntax: c12[,[*m1*][,*m2*][,*m3*]]

Default:

,*m1* = 0 Printer selects the number of columns needed to create a symbol that is as close to square as possible. The range for *m1* is 0 to 30.

,*m2* = 9 The printer automatically selects the error correction level based on the amount of data. The range for ,*m2* is 0 to 9.

,*m3* = 0 Truncating disabled. The values for ,*m3* are 0 and 1.

Notes: PDF417 is a stacked 2D symbology that provides the ability to scan across rows of code. Each row consists of start/stop characters, row identifiers, and symbol characters, which consist of four bars and four spaces each and contain the actual data. This symbology uses error correction symbol characters appended at the end to recover loss of data.

Selecting the Number of Columns

Set ,*m1* to zero to have the printer select a height magnification that is three times the width magnification for the symbol. The specifications of PDF417 recommend these magnification values for creating a symbol that you can scan easily.

Selecting an Error Correction Level

The level of error correction that works best for your data depends on the amount of characters in your symbols. If you decide to select your own error correction level, you need to estimate the number of characters since they are formed by compressing the raw data you send to the printer. In general, 1.8 alphanumeric characters generate one symbol character. If you are using numeric data, 2.9 digits generate one data symbol character.

Intermec recommends that you leave the error correction level at the default setting of 9. This setting lets the printer select a level, between level 2 and level 5, that provides the most efficient error correction of your data. The printer bases the level selection on the number of symbol characters your data generates.

The following table shows the *m2* values (error correction levels), the recommended data amount that you should use for each level, and the number of error correction characters the level generates.

,*m2*	Recommended Data Amount	Error Detection Characters	
0	*	2	(error detected, no recovery)
1	*	4	
2	1 - 40	8	
3	41 - 160	16	
4	161 - 320	32	
5	321 - 863	64	
6	†	128	
7	†	256	
8	†	512	
9	‡		

* You should only use ,*m2* values of 0 and 1 if your labels do not have enough space for more error correction characters. These values are generally not recommended.

† The printer reserves ,*m2* values of 6, 7, and 8 for special applications where the symbol is subject to damage and requires a higher level of error correction.

‡ An ,*m2* value of 9 lets the printer set *m2* to the recommended value for each symbol based on the number of characters. An m2 value of 9 is the default setting.

Setting the Truncate Flag

The truncate flag determines if the symbol is printed in truncated form. A trucated symbol prints without right row indicators and with only a one-module wide stop character. To minimize errors and maintain the best reading performance, Intermec recommends that ,*m3* be set to 0.

The approximate data capacity (maximum number of characters allowed) for the three character sets is: Full ASCII, 1108; Alphanumeric, 1850; Numeric, 2725.

Note: *2D symbols encode data by compressing it in different amounts. Therefore, use these values as guidelines. The exact data capacity varies with the actual data being encoded.*

Code One

Syntax: `c13[,[,m1][,m2,m3]]`

There are 15 versions of Code One. Each version has a different maximum data length.

Defaults: ,*m1* = 0 Code One version, variable.

,*m2* = 1 First position in the group.

,*m3* = 1 Total number of symbols in the group is one symbol.

Notes: ***Selecting a Code One Version***

,*m1* is the version of Code One you are printing.

`c13,0[,m2,m3]`	Code One, variable length (autoselects from version A to version H)
`c13,1[,m2,m3]`	Version A
`c13,2[,m2,m3]`	Version B
`c13,3[,m2,m3]`	Version C
`c13,4[,m2,m3]`	Version D
`c13,5[,m2,m3]`	Version E
`c13,6[,m2,m3]`	Version F
`c13,7[,m2,m3]`	Version G
`c13,8[,m2,m3]`	Version H
`c13,9[,m2,m3]`	Version S10
`c13,10[,m2,m3]`	Version S20
`c13,11[,m2,m3]`	Version S30
`c13,12[,m2,m3]`	Version T16
`c13,13[,m2,m3]`	Version T32
`c13,14[,m2,m3]`	Version T48

It is important that you select the correct version of Code One for the data you are encoding. If you try to encode data in the wrong version, your symbol may not print.

If your data lengths vary greatly for different labels, or if you are not sure which symbology to select, use the default setting. The printer will print the correct version of Code One (from version A to version H) based on data length. If you know your data lengths are consistent, or if the printer always chooses the same version, you should manually select the Code One version to save printer memory.

When you print Code One symbols, you may notice that part of your symbol contains no data. This occurs because each version of Code One has a fixed size and the version that is large enough to accommodate all your data may be larger than you need. However; be careful about using a smaller size version, because if it is too small for your data to fit, the symbol will not print.

The following table shows the data lengths that each Code One version accommodates.

Note: *The data lengths in the table are approximations of the maximum amount of data for each version of Code One. The printer compresses the data before it encodes it, which shortens the length of the amount you send. This condition should not affect printing, but if you select the variable length, the printer may select a Code One version that is smaller than the one listed next to your data length.*

m1 **Value**	**Code One Type**	**Full ASCII**	**Alphanumeric**	**Numeric**
0	variable*			
1	A	10	13	22
2	B	19	27	44
3	C	44	64	104
4	D	91	135	217
5	E	182	271	435
6	F	370	553	886
7	G	732	1096	1755
8	H	1480	2218	3550
9	S10	†	†	6
10	S20	†	†	12
11	S30	†	†	18
12	T16	10	13	22
13	T32	24	34	55
14	T48	38	55	90

* Printer selects the correct Code One type based on data length.

† Encodes only numeric data.

Note: *For full ASCII and alphanumeric columns, the maximum number of characters is actually less than those listed for each version of Code One. That number varies depending upon the number of character type changes (lowercase to uppercase, numeric to alphanumeric, and so on). The more shifts between these different types, the less data you can encode.*

Grouping Symbols

Use *,m2* (position of the current symbol in the group) and *,m3* (total number of symbols in the group) to define symbols that are part of a group. For example, a setting of [,2,5] indicates that the current symbol definition is the second in a group of five.

Both *,m2* and *,m3* range from 1 to 15, with a default of 1.

Note: *If you are using groups of symbols with the* ,m2 *and* ,m3 *variables, make sure* ,m2 *(the position in the group) is never greater than* ,m3 *(the total number of symbols in the group).*

The printer does not check to ensure that you define all positions of a group. For example, if you set *,m3* to 5, and you define only three positions, the printer will print the three positions. However; when you scan these symbols, the scanner will wait for all five symbols and will not be able to transmit the data.

Defining Height and Width for Code One

Code One modules must be square. Therefore, when you define a field for Code One, you only need to enter one value for both the height and width magnification. If you enter more than one value, the printer uses the last value for both height and width and ignores all previously entered magnification values. If you do not enter a value, the printer uses a default value of 3 for both height and width magnification.

Using Groups of Code One Symbols

You can use groups of Code One symbols to encode data so that you can scan separate symbols more efficiently. When you scan a group of symbols, the scanner accumulates the data from all members of the group and transmits the data as if it came from a single symbol.

Maxicode

Syntax: c14[,*m1*][,*m2*][,*m3*]

Defaults: ,*m1* = 0 Mode 0, Structured Carrier Message.

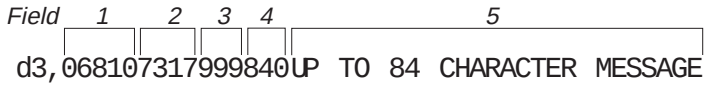
,*m2* = 1 Not supported at this time.

,*m3* = 1 Not supported at this time.

Notes: When you select Maxicode, you must format your data to conform to five fields.

Field	Characters Allowed	Field Description	Default
1	5	ZIP code	None
2	4	ZIP code extension	None
3	3	Service class	999
4	3	Country code	840 (U.S.)
5	84	Message	None

You can format the data with or without inserting delimiters between the fixed-length fields, governed by the number of characters comprising the field. An example format without delimiters is shown below:



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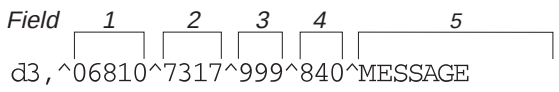
Note: *Remember, the d3 command defines the data source in Program mode.*

Or, you can format data using the carat-delimiting field, as shown in the next example:



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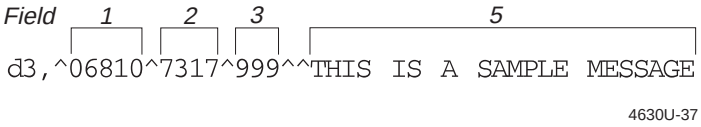
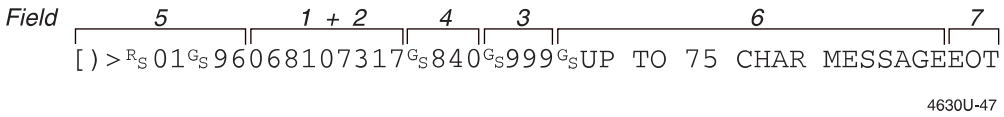
With this method of delimiting data, fields can be left out (as long as the carats remain) and the firmware will fill in the default as shown in the following example. With the carat-delimited format, you must completely fill in all fields, except the message field.



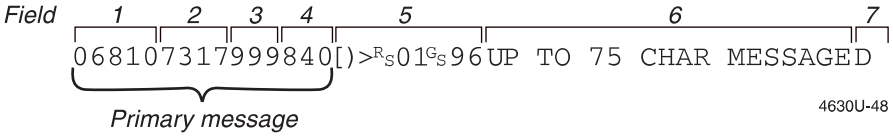
In this example, the country code is left out, with the delimiting carat inserted. The printer firmware fills in the default value of 840 (USA).

Printing Mode 2 and Mode 3 Compatible Bar Codes

IPL does not currently support Maxicode Modes 2 and 3; however, you can print a Mode 2 and 3 compatible bar code. The sample data format shown below prints a Mode 2 and 3 bar code on a printer that supports Maxicode Mode 2 and 3.



You must restructure the data to print a Mode 2 and 3 compatible bar code on the 4630 and 4830 printers:



The data fields in the sample format are described below:

Field	Characters Allowed	Field Description	Default
1	5	ZIP code	None
2	4	ZIP code extension	None
3	3	Service class	999
4	3	Country code	840 (U.S.)
5	9	Header	None
6	75	Message	None
7	1	Data terminator	D

For your printer to print Mode 2 and 3 compatible symbols, you must restructure the data:

- Insert the Mode 2 and 3 header immediately after the country code at the beginning of the secondary message.
- Make the fields contiguous and fill in all fields.
- Swap the order of the country code (field 4) and the service class (field 3).
- Terminate your data with an uppercase D.
- No control characters ($^{R}_{S}$ or $^{G}_{S}$) in the primary message.

HIBC Code 128

Syntax: `c16[,m1][,m2]`

The following three modifiers conform to Supplier Standard:

`c16,0`	Select HIBC Code 128, primary format.
`c16,1`	Select HIBC Code 128, alternate primary format.
`c16,2,m2`	Select HIBC Code 128, secondary format. The linkage character comes from ,*m2*, which is the field identifier.

The following four modifiers conform to Provider Standard:

`c16,3`	Single format.
`c16,4`	First data format.
`c16,5,m2`	Select HIBC Code 128. Second data format. The linkage character comes from ,*m2*, which is the field identifier.
`c16,6`	Select HIBC Code 128. Multiple data format.

Default: ,*m1* = 0

Bar Code Field, Create/Edit

Purpose: Use this command to edit or create a bar code field *n*.

Syntax: `Bn[,name]`

n values can range between 0 and 199.

,*name* is an optional field. The field can be up to eight ASCII characters (not counting the semicolon) and cannot start with a numeric character.

Default: *n* = 0

Notes: Parameters for the default field:

Bar code = Code 39	Height magnification = 50
Check digits = disabled	Interpretive = disabled
Data length = 20	Prefix = none
Data origin = Print mode	Ratio= 3 to 1
Field direction = 0°	Width magnification = 1
Field origin = 0,0	

Bitmap Cell Height for Graphic or UDF, Define

Purpose: Defines the height of a graphic or user-defined font.

Syntax: y*n*

n can range between 1 and 600. *n* is the number of rows for a graphic or font (bitmap).

For outline fonts, *n* is the height of the base character in number of dots.

Default: *n* = 1 Bitmap fonts and graphics
n = 10 Outline fonts

Notes: An error code (52) is generated for an invalid height.

Bitmap Cell Width for Graphic or UDF, Define

Purpose: Defines the maximum width for a graphic or any character in a font. Each character has a width within this amount, which should be at least as wide as the widest character in the font.

Syntax: x*n*

n can range between 0 and 599. *n* is the number of columns for the UDC, bitmap, or user-defined font.

For outline fonts, *n* is the width of the base character in number of dots.

Default: *n* = 1 Bitmap fonts and graphics
n = 10 Outline fonts

Notes: An error code (52) is generated if the width is invalid.

Bitmap User-Defined Font, Clear/Create

Purpose: Use this command to clear or create a user-defined bitmap font set.

Syntax: T*n*[,*name*]

n is the font ID number and can range from 3 to 6 and 8 to 19.

,*name* is an optional field. The field can be up to eight ASCII characters (not counting the semicolon).

Notes: If font set *n* has already been defined, all previous characters in the font set are erased. An existing font cannot be edited, only recreated. To change any characters, the entire font set must be transmitted.

Border Around Human-Readable Text, Define

Purpose: Defines a border around a human-readable field.

Syntax: b*n*

n values range from 0 to 199.

Default: *n* = 0 No borders (black letters).

Notes: When *n* is greater than 0, the field prints white letters with an *n* dot size border surrounding the field.

Box Field, Create/Edit

Purpose: Use this command to access or create a box field *n*.

Syntax: W*n*[,*name*]

n can range between 0 and 199.

,*name* is an optional field. The field can be up to eight ASCII characters (not counting the semicolon).

Default: *n* = 0

Notes: Parameters for the default field:

Field origin = 0,0	Box length = 100
Field direction = 0°	Box height = 100
	Box width = 1

Character Origin Offset, Define

Purpose: Defines the offset, to the right, of all characters in a font. If each character's width is defined in columns, with the first column numbered 0, then the origin of each character is at the column with the same number as *n*.

Syntax: X*n*

n values can range between 0 and 599. For example, *n* = 2 shifts the character origins over two columns to the right.

Default: *n* = 0

Notes: For bitmap fonts only.

Character Rotation or Bar Code Ratio, Define

Purpose: Defines the character rotation for human-readable fields, or the bar code ratio for a bar code field.

Syntax: r*n*

For human-readable fields, *n* is the rotation:
n = 0 Horizontal
n = 1 90 degrees counterclockwise.

For bar code fields, *n* is the ratio of the wide elements to the narrow elements:
n = 0 2.5 to 1
n = 1 3.0 to 1
n = 2 2.0 to 1

Default: *n* = 0 Human-readable field
n = 1 Bar code field

Notes: If the bar code width is odd and r0 is selected, r1 will be substituted.

Code 39 Prefix Character, Define

Purpose: Defines the prefix for a Code 39 field only.

Syntax: p[*n1*][*n2*][*n3*][*n4*]

n values can range between uppercase A to Z and 0 to 9.

Default: No prefix

Notes: The @ character clears all prefixes when entered as *n1*. Prefix characters do not appear in the interpretive field.

Command Tables, Load

Purpose: Downloads a command table, with *t* as the command table identifier. This is followed by the nibblized command entries (c1 - c*n*) to be loaded into the table. To change an entry in the table, the entire table must be sent to the printer as a string of ASCII characters in hexadecimal form. Any entry not redefined retains its old value. The printer expects two hex digit bytes for every entry in the table.

Syntax: C*t, command 1, command 2, ... command n*

t can range from 0 to 4. *t* is the command table identifier.

Data must be nibblized ASCII characters ranging from 0 to 9 and A to F.

Notes: New commands become effective after the printer is reset or the power is cycled. Command tables are listed later in this chapter.

Current Edit Session, Save

Purpose: Saves the current page, format, UDC, or UDF being edited. The printer remains in Program mode.

Syntax: N

Field, Delete

Purpose: Deletes field *n* from the format.

Syntax: D*n*

n values can range between 0 and 199.

Default: *n* = 0

Notes: The last field in a format cannot be deleted. If the current field is deleted, the field pointer points to the next field. If you delete a master field, you also delete all slave fields of that master field.

Field Data, Define Source

Purpose: Defines a data source for the current field and how many characters are in the field.

Syntax: d*n*[,*m1*][,*m2*];

n can range from 1 to 3.

,*m1* is the number of characters that can be entered into the field and can range from 1 to 200.

,*m2* is an optional positive integer numeric field offset that can range from 0 to 9999.

Default: *n* = 0 or 1, ,*m1* = 20 Bar code fields
n = 0 or 1, ,*m1* = 30 Human-readable fields

n = 2, ,*m2* = 0

Notes: d0[,*m1*] and d1[,*m1*];
Optional data is entered in Print mode. *m1* is the maximum number of data (up to 200 characters) that can be entered into this field.

d2,[*m1*][,*m2*];
Data is copied to this field from field *m1*. You must define field *m1* before you can use this command. Only data delimited by numeric field separator (FS), or alphanumeric field separator (GS), can use the offset. A bar code field cannot copy data from a human readable field but a human readable field can copy data from a bar code field.

d3,[*m1*];
Fixed data *m1* is stored as part of the format and is used every time the current field is printed. The maximum number of characters in a field (including non-printing characters) is 200. Data entered cannot be changed by print commands.

Field Direction, Define

Purpose: Defines the field rotation.

Syntax: f*n*

n = 0 Horizontal
n = 1 Rotated 90 degrees counterclockwise from horizontal.
n = 2 Rotated 180 degrees counterclockwise from horizontal.
n = 3 Rotated 270 degrees counterclockwise from horizontal.

Default: *n* = 0

Field Origin, Define

Purpose: Defines the origin for a field. The field origin is the upper left corner of the field. Horizontal *n* and vertical *m* locations represent the number of dot increments from the label's origin. The origin (0,0) is the upper left square on the label.

Syntax: o*n*,*m*

n values can range between 1 and 19999
m values can range between 1 and 19999.

Default: *n* = 0
m = 0

Font, Select Type

Purpose: Selects a font type for human-readable fields.

Syntax: c*n*[,*m1*]

For human-readable fields, *n* values can range between 0 and 41.

Default: *n* = 0

Notes: Modifiers apply only to bar code symbologies. Fonts and bar codes are listed at the end of the Program mode command descriptions.

Font Character Width, Define

Purpose: Defines the amount of space from the origin of one letter to the origin of the next. If *n* is too small, characters may overlap.

Syntax: z*n*

n values can range between 0 and 599.

Default: Character bitmap width, minus the font character offset (X*n*) plus the intercharacter space (z*n*).

Notes: For bitmap characters only.

Format, Create/Edit

Purpose: Use this command to edit or create a format *n*.

Syntax: A*n*[,*name*] or F*n*[,*name*]

n is the format ID number. Values can range between 1 and 19.

,*name* is an optional field. The field can be up to eight ASCII characters (not counting the semicolon) and cannot start with a numeric character.

Notes: An error code is generated if the format number is out of range.

Format Direction in a Page, Define

Purpose: Defines the format directions within a page.

Syntax: q*n*

n = 0 Horizontal.
n = 1 Rotate 90 degrees counterclockwise from horizontal.
n = 2 Rotate 180 degrees counterclockwise from horizontal.
n = 3 Rotate 270 degrees counterclockwise from horizontal.

Default: *n* = 0

Format, Erase

Purpose: Erases format ID number *n*.

Syntax: E*n*

n values can range between 1 and 19.

Format Offset Within a Page, Define

Purpose: Defines the format offsets within a page and creates new origins for fields within a format by adding the format offsets to the original field offsets. *m* and *n* represent increments of dot sizes.

Syntax: O*n*,*m*

n values can range between 1 and 19999.
m values can range between 1 and 19999.

Default: *n* = 0
m = 0

Format Page Position, Assign

Purpose: Assigns the format *n* (format ID) to page position *p*.

Syntax: M*p*,*n*

p values can range between a and z.
n values range from 0 to 19.

Default: *p* = a

Notes: A format may be in multiple positions. An error code is generated if the format ID is out of range.

Format Page Position, Define Data Source

Purpose: Defines a data source for a format assigned to a page position.

Syntax: e*n*[,*m1*][,*m2*];

e0; The format receives its data during Print mode.

e1[,*m1*][,*m2*]; The format is a slave of another format within this page.

,*m1* is the position of the master format within the page.

,*m2* is the data offset to apply to the slave format. Only data delimited by numeric field separator <FS> or alphanumeric field separator <GS> can be offset.

Default: *n* = 0
m1 = a
m2 = 0

Notes: The format ID must be the same for both the master and slave formats.

Format Page Position, Delete

Purpose: Deletes the format page position *p* from a page.

Syntax: m*p*

p values can range between a and z.

Default: *p* = a

Graphic, Select Type

Purpose: Selects a graphic for graphic fields.

Syntax: c*n*

Values for *n* can range between 0 and 99.

Default: *n* = 0

Notes: This command applies to graphic fields only.

Graphic or UDC, Define

Purpose: Maps one column of bitmap for a graphic or a font character. *n* is the column to be mapped.

Syntax: u*n,m...m*

n values can range between 0 and 599.

Notes: Each data byte *m* represents 6 bits of the bitmap. See Chapter 5 for an example.

Height Magnification, Define

Purpose: Defines box, bar code, or character height magnification. For bar code and box fields, the height *n* is defined in number of dot increments.

Syntax: h*n*

n values can range between 1 and 250 for human-readable fields and graphics. For bar code and box fields, the range for *n* is from 1 to 9999.

Default:

n = 50	Bar code height
n = 100	Box height
n = 2	POSTNET and human-readable fields
n = 1	Graphics

Notes: For human-readable fields, graphics, and the POSTNET symbology, *n* represents the vertical magnification of the character bitmap.

Human-Readable Field, Create/Edit

Purpose: Use this command to edit or create a human-readable field *n*.

Syntax: H*n*[,*name*]

n values can range between 0 and 199.

,*name* is an optional field. The field can be up to eight ASCII characters (not counting the semicolon) and cannot start with a numeric character.

Default: *n* = 0

Notes: If *n* does not exist, a default human-readable field is created.

Parameters for the default field:
Border = disabled
Character rotation = 0°
Data length = 30
Data origin = Print mode
Field direction = 0°
Field origin = 0,0
Font = 7x9 standard
Height magnification = 2
Pitch = disabled
Point = disabled
Width magnification = 2

Intercharacter Space for UDF, Define

Purpose: Defines the intercharacter gap length for a user-defined bitmap font in dot increments.

Syntax: z*n*

n values can range between 0 and 199.

Default: *n* = 2

Notes: An error code (52) is generated for invalid lengths.

Interpretive Field, Edit

Purpose: Use this command to edit an interpretive field.

Syntax: I*n*

n is the ID number of the corresponding bar code field. The range is from 0 to 199.

Notes: Interpretive fields cannot be created with this command; they can only be created or deleted with the i command when editing the corresponding bar code field.

Interpretive Field, Enable/Disable

Purpose: Determines if the interpretive field of the current bar code field prints.

Syntax: i*n*

n = 0 Disables the interpretive field.
n = 1 Enables the interpretive field with start and stop characters.
n = 2 Enables the interpretive field without start or stop characters.

Default: *n* = 0

Notes: When enabled, the human-readable information in font 0 (7x9 std) is printed left justified, 2 dots below the bar code field.

Length of Line or Box Field, Define

Purpose: Defines the length of a line or box by the number of dot increments.

Syntax: l*n*

n values can range between 1 and 9999 dots.

Default: *n* = 100 dots

Line Field, Create/Edit

Purpose: Use this command to access or create a line field *n*.

Syntax: L*n*[,*name*]

n values can range between 0 and 199.

,*name* is an optional field. The field can be up to eight ASCII characters (not counting the semicolon) and cannot start with a numeric character.

Default: *n* = 0

Notes: Parameters for the default field:
Field origin = 0,0
Field direction = 0°
Line length = 100
Line width = 1

Outline Font Description, Download

Purpose: Use this command to download an outline font description. All characters are loaded at once; not individually as with bitmap fonts. Since the maximum message length is 255 characters, the data may have to be split between successive j commands.

Syntax: j*font description...*

Notes: The printer stores all incoming data into the font selected with the Outline User Defined Font (J) command.

Example: J4, *font name*;
x30;y30;
jAFB0...4E; (maximum 255 characters)
jB32C...FF; (maximum 255 characters)

The font information must be sent to the printer as a string of ASCII characters in hexadecimal form. The printer expects two hex digit bytes for every eight-bit byte of information. Data must be nibblized ASCII hex characters.

Outline User-Defined Font, Download

Purpose: Selects an outline Bitstream Speedo font to download.

Syntax: J*n*[,*name*]

n is the font ID number, from 3 to 6 and 8 to 19.

,*name* is an optional field. The field can be up to eight ASCII characters (not counting the semicolon) and cannot start with a numeric character.

Notes: If font *n* has already been defined, the font is erased and redefined.

Page, Create/Edit

Purpose: Use this command to edit or create a page.

Syntax: S*n*

n is the numeric page ID and can range between 1 and 9.

Notes: The default page (page 0) cannot be edited. An error code is generated if a page number is out of range.

Page, Delete

Purpose: Use this command to delete a page.

Syntax: s*n*

n is the numeric page ID and can range between 1 and 9.

Notes: The default page (page 0) cannot be deleted.

Pitch Size, Set

Purpose: This command sets the pitch size, which defines the size of the characters in human-readable fields. When used, the height and width magnification and point size commands are ignored.

Syntax: g*n*

n values can range between 1 and 50.

Default: *n* = 12

Notes: This command can be used for both bitmap and outline fonts.

Point Size, Set

Purpose: This command sets the point size, which defines the size of the characters in human-readable fields.

Syntax: k*n*

n values can range between 4 and 212.

Default: *n* = 12

Notes: This command works most effectively on scalable fonts c25, c26, and c27.

Program Mode, Exit

Purpose: Instructs the printer to exit Program mode and enter Print mode. Any format or page currently being edited is saved.

Syntax: R

User-Defined Character, Clear/Create

Purpose: This command clears or creates a graphic bit map.

Syntax: G*n*[,*name*]

n values can range between 0 and 99.

,*name* is an optional field. The field can be up to eight ASCII characters (not counting the semicolon) and cannot start with a numeric character.

Notes: If graphic *n* has already been defined, it is erased and redefined.

User-Defined Character Field, Create/Edit

Purpose: Use this command to edit or create a graphic field *n*.

Syntax: U*n*[,*name*]

n values can range between 1 and 199.

,*name* is an optional field. The field can be up to eight ASCII characters (not counting the semicolon) and cannot start with a numeric character.

Default: *n* = 0

Notes: Parameters for the default field:
Character rotation = 0°
Field direction = 0°
Field origin = 0,0
Height magnification = 1
Width magnification = 1
UDC = 0

User-Defined Font Character, Create

Purpose: Specifies which font character is to be defined. *n* is the decimal representation of the ASCII character.

Syntax: `t`*n*`[,`*name*`]`

n values can range between 0 and 255.

,*name* is an optional field. The field can be up to eight ASCII characters (not counting the semicolon) and cannot start with a numeric character.

Notes: An error code is generated if the format number is out of range.

Width Magnification, Define

Purpose: Defines the width magnification of a line, box, bar code, or character. For line, box, or bar code fields, the width of the narrow element is defined by number of dot increments *n*. For human-readable fields, graphics and the POSTNET symbology, *n* is the magnification of the character width.

Syntax: `w`*n*

Values for *n* can range between 1 and 9999 for line, box, and bar code fields. Human-readable fields, graphics, and POSTNET symbology values can range between 1 and 250.

Default: *n* = 1 Line, box, and bar code fields and graphics.
n = 2 Human-readable fields and POSTNET.

Test and Service Mode Command Descriptions

To enter Test and Service mode from Print mode, send <ESC>T from the host terminal.

***Note**: All commands in Test and Service mode end with a semicolon (;) except the last command in a message.*

Syntax	Command Name	Description
C;	Pitch Label, Print	Prints the pitch label.
D;	Printer Configuration, Reset	Sets the printer configuration to the factory defaults. When you exit Test and Service mode after sending this command, the printer performs a warm boot (it resets).
G;	Transmissive Sensor Value, Transmit	Transmits the label gap transmissive sensor A/D output back to the host. Value ranges from 00 to 255.
L;	Label Path Open Sensor Value, Transmit	Transmits the paper path open switch value back to the host. A value of 0 indicates the paper path is open and a value of 1 means it is closed.
M;	Reflective Sensor Value, Transmit	Transmits the label mark reflective sensor A/D output back to the host. The value ranges from 00 to 255.
P;	Printhead Temperature Sensor Value, Transmit	Transmits the printhead thermistor A/D output back to the host. Range of the value is 00 to 255.
Q;	Quality Label, Print	Prints the print quality program and model number label.
R;	Test and Service mode, Exit	Exits Test and Service mode.
T;	Label Taken Sensor Value, Transmit	Transmits the label taken sensor A/D output back to the host. The value can range from 00 to 255.

User-Defined Interface Tables

These command tables show commands in the order they must be downloaded when you replace the User-Defined Command / Protocol characters.

Print Commands (t = 0) {xe "Print mode commands:downloading"}{xe "downloading:Print mode commands"}

The following commands are listed in the order they must be downloaded.

Description	Command	Hex Value
Command Terminator 1	NUL	00
Set Preamble	SOH	01
Set Postamble	EOT	04
Status Enquiry	ENQ	05
Select First Data Entry Field	ACK	06
Transmit Error Code	BEL	07
Warm Boot	BS	08
Command Terminator 2	LF	0A
Status Dump	VT	0B
Form Feed	FF	0C
Select Next Data Entry Field	CR	0D
Cut	SO	0E
Go To Shift Command Table	SI	0F
Reset	DLE	10
Set Intercharacter Delay	SYN	16
Print	ETB	17
Clear All Data	CAN	18
Abort Print Job	EM	19
Data Shift	SUB	1A
Go To Escape Command Table	ESC	1B
Numeric Field Separator	FS	1C
Alphanumeric Field Separator	GS	1D
Set Quantity Count	RS	1E
Set Batch Count	US	1F
Clear Data From Current Field	DEL	7F

Escape Print Commands (t = 1)

This following commands are listed in the order they must be downloaded.

Description	Command	Hex Value
Set Message Delay	SYN	16
Enter Start / Stop Character	(space)	20
Set Field Decrement	D	44
Select Format	E	45
Select Field	F	46
Select Page	G	47
Transmit Printhead Parameters	H	48
Set Field Increment	I	49
Transmit Label and Gap Length	L	4C
Transmit Software Version Number	M	4D
Disable Increment / Decrement	N	4E
Transmit Options Selected	O	4F
Enter Program Mode	P	50
Transmit Quantity and Batch Count	Q	51
Enter Test and Service Mode	T	54
Transmit User-Defined Command Tables	Z	5A
Enable Auto-Transmit 2	d	64
Enable Auto-Transmit 3	e	65
Enable Auto-Transmit 1	j	6A
Disable Auto-Transmit 1, 2 and 3	k	6B
Transmit Static RAM Usage	m	60
Transmit Configuration Parameters	p	70
Transmit User-Defined Characters	u	75
Transmit Font	v	76
Transmit Format	x	78
Transmit Page	y	79

Shift Print Commands (t = 2)

The following commands are shown in the order they must be downloaded. These commands must be preceded by the Go To Shift Command Table command (default value SI) listed in the table of Print Commands (*t* = 0).

Description	Command	Hex Value
Set Control Panel Access Permission	A	41
Set End-of-Print Skip Distance	D	44
Set Top-of-Form	F	46
Transmit Printhead Parameters	H	48
Set Number of Image Bands	I	49
Set Maximum Label Length	L	4C
Define Static RAM Size	N	4E
Online or Offline on Power Up	O	4F
Enable or Disable Label Retract	R	52
Set Print Speed	S	53
Select Label Stock Type	T	54
Set Printhead Test Values	U	55
Set Label Width	W	57
Enable or Disable Audible Alarm	a	61
Enable or Disable Cutter	c	63
Set Dark Adjust	d	64
Label Rest Point, Adjust	f	66
Select TTR or Direct Thermal	g	67
Enable or Disable Translation	i	69
Select Printer Language	l	6C
Set Label Retract Distance	r	72
Enable or Disable Self-Strip	t	74

Status Responses and Auto-Transmit Commands (t = 3)

The following responses and codes are listed in the order they must be downloaded.

Status Description	Status Response	Hex Value
Buffer Already Full	GS	1D
Printhead Test Fail	SO	0E
Label Path Open	US	1F
Ribbon Fault	US	1F
No Label Stock	EM	19
Buffer Now Full	DC3	13
Takeup Reel Full	BS	08
Label at Strip Pin, Cutter Busy / Jammed	FS	1C
Skipping	DC1	11
Printing	DC1	11
Ready	DC1	11
Clear	DC1 -Auto-Transmit 1	11
Label at Strip Pin, Cutter Busy / Jammed	FS - Auto-Transmit 1	1C
Takeup Reel Full	BS - Auto-Transmit 1	08
No Label Stock	EM - Auto-Transmit 1	19
Ribbon Fault	US - Auto-Transmit 1	1F
Room in Buffer	DC1 - Auto-Transmit 2	11
Imager Overrun	HT - Auto-Transmit 3	09
Print Job Complete and Buffer Empty	SOH - Auto-Transmit 3	01
Insufficient RAM	RS - Auto-Transmit 3	1E

***Note**: The status responses in the above table are for standard protocol. In XON/XOFF protocol, most of the status responses are the same; however, instead of DC1, the status response is DC2, and instead of DC3, the status response is DC4.*

Protocol Commands (t = 4)

The following list contains the protocol codes in the order they must be downloaded.

Description	Command	Hex Value
SELECT IN	GS	1D
POLL IN	FS	1C
RES IN	EOT	04
REQ IN	ENQ	05
SOM IN	STX	02
EOM IN	ETX	03
AFF IN	ACK	06
NEG IN	NAK	15
DLE IN	DLE	10
XON IN	DC1	11
XOFF IN	DC3	13
SELECT OUT	GS	1D
POLL OUT	FS	1C
RES OUT	EOT	04
REQ OUT	ENQ	05
SOM OUT	STX	02
EOM OUT	ETX	03
AFF OUT	ACK	06
NEG OUT	NAK	15
DLE OUT	DLE	10
XON OUT	DC1	11
XOFF OUT	DC3	13
Proto-Cmd 1	ENQ	05
Proto-Cmd 2	VT	0B
Timeout on EOM ACK	20 (ms) (Range: 0 - 255)	14

Fonts

Fonts may be selected using the Font, Select Type (c*n*) command.

Font Selection	Font Description
c0	7x9 standard
c1	7x11 OCR
c2	10x14 standard
c3-c6	User-defined fonts
c7	5x7 standard
c8-c19	User-defined fonts
c20	8 point standard
c21	12 point standard
c22	20 point standard
c23	OCR A
c24	OCR B size 2
c25	Outline font (monospaced 821 Standard)
c26	Outline font (monospaced 821 Bold)
c27	Outline font (proportional Dutch Roman 801)
c30	6 point bold
c31	8 point bold
c32	10 point standard
c33	10 point bold
c34	12 point bold
c35	16 point standard
c36	16 point bold
c37	20 point bold
c38	24 point standard
c39	24 point bold
c40	30 point bold
c41	36 point bold

Printing 2D Symbologies

When you encode and print 2D symbologies, use the following guidelines:

- Select a symbol size that can encode all the data being downloaded. If you select one that is too small, then the symbol will not print. If you do not know the amount of data you are sending, allow space for the largest possible amount.
- In Program mode, the data length is confined to 255 characters. This means that the d3 command, which is used to define data in Program mode, cannot be followed by more than 255 characters. To send more than 255 characters, you must send the data in Print mode using the d0 command.
- To send more than 255 characters in Print mode with the d0 command, you must separate the data into packets of 255 characters. These packets are separated by <STX> and <ETX>.
- The maximum amount of data that can be entered into a field with the d0 command is 3550 characters. However, if you are declaring d0 fields to be much larger than necessary, you may run out of memory, especially if you use the maximum value of 3550. To avoid wasting memory, estimate the largest amount of data you will send and use a value that is close to that amount.

7

Special Procedures

This chapter contains instructions for:

- ***Copying the entire RAM contents from one printer to another (cloning).***
- ***Copying selected formats, fonts, graphics, and pages from one printer to another printer.***

Performing Cloning

Cloning is a procedure that copies the RAM contents (configuration data, formats, formats, pages, and graphics) from one printer (the sender printer) to another printer (the receiver printer). By programming and configuring just one printer and then cloning its RAM to other printers, you can configure a large number of printers in much less time than it takes to program them individually.

Before you perform the cloning procedure, you must be aware of the following limits:

- You can only clone from like printer to like printer. For example, you cannot clone a 3400 printer to a 4630 or a 4830 printer. You also cannot clone a 4630 to a 4830 printer and vice versa.
- The sender and receiver printers must be running the same firmware version.
- The sender and receiver printer must have exactly the same amount of static RAM installed.
- If you are cloning printer configuration parameters to printers that are used in a multi-drop environment, be sure to assign each printer a unique device address when cloning is complete.

If you are not sure of the printer RAM configuration, firmware version, or setup configuration, print a configuration test label. See Chapter 2 for more information about printing a configuration test label.

Preparing the Receiver Printer

Note: *Cloning will erase any data stored in the receiver printer.*

1. From the OFFLINE READY display, press Menu and then press ↑ or ↓ until you reach the Service menu.
2. Press Select and then press ↑ or ↓ until the display shows:

   ```
   SERVICE MENU
     CLONING
   ```

3. Press Select and then press ↑ or ↓ until the display shows:

   ```
     CLONING
   RECEIVER
   ```

4. Press Enter. The print is ready to receive data.

Preparing the Sender Printer and Downloading Data

1. Connect the main serial ports of the sender and the receiver printers with an RS-232 null modem serial cable (Intermec P / N 049353).
2. From the OFFLINE READY display of the sender printer, press Menu and then press ↑ or ↓ until you reach the Service menu.
3. Press Select and then press ↑ or ↓ until the display shows:

   ```
   SERVICE MENU
     CLONING
   ```

4. Press Select and then press ↑ or ↓ until the display shows:

   ```
     CLONING
   SENDER
   ```

5. Press Select. The display shows:

   ```
     SENDER
   EXECUTE TEST
   ```

   The sender printer is ready to download data to the receiver printer.

6. Press Enter to download the RAM contents to the receiver printer. During downloading, the display shows:

   ```
   TRANSFERRING
   ```

   When the downloading process is complete, the sender printer display shows:

   ```
     SENDER
   EXECUTE TEST
   ```

The receiver printer display shows:

```
CLONING
RECEIVER
```

Cloning is now complete. Disconnect the serial cable from the receiver printer.

To clone another printer

1. Use the menu panel on the new printer to designate it as the receiver printer.
2. Connect the main serial port of the receiver printer to the serial cable attached to the sender printer.
3. Press Enter on the sender printer menu panel.

Performing Selective Transfer

If you want to copy select fonts, formats, graphics, or pages from one printer to another printer, but you do not want to clone the entire RAM contents, you can use the Selective Transfer command. Use this command to set up different printers to print the same label formats.

Note: *The receiver printer must have enough RAM to accommodate the information downloaded from the sender printer.*

Preparing the Receiver Printer

Configure the receiver printer with the following communication settings:

- 9600 baud
- 7 data bits
- Even parity
- 1 stop bit

Preparing the Sender Printer

1. Connect the main serial ports of the sender and the receiver printers with an RS-232 null modem serial cable (Intermec P / N 049353).
2. From the OFFLINE READY display of the sender printer, press Menu and then press ↑ or ↓ until you reach the Service menu.

3. Press Select and the press ↑ or ↓ until the display shows:

```
  SERVICE MENU
SELECTIVE TRANS
```

4. Press Select.

The sender printer is ready to download data to the receiver printer.

Sending Formats, Fonts, Pages, and Graphics to the Receiver Printer

You can send pages, formats, fonts, and graphics from the sender printer to the receiver printer, either all at once or as selected items. Before performing any of the following procedures, you must have prepared both the sender and receiver printers.

To download all pages, formats, fonts, and graphics

1. On the sender printer, press ↑ or ↓ until the display shows:

```
SELECTIVE TRANS
   SEND ALL
```

2. Press Select. The display shows:

```
   SEND ALL
EXECUTE TEST
```

3. Press Enter to download the data to the receiver printer. During downloading, the display shows:

```
TRANSFERRING
```

4. When the downloading process is complete, the display on the sender printer shows:

```
   SEND ALL
EXECUTE TEST
```

5. Disconnect the serial cable from the receiver printer.

To download specific pages, formats, fonts, or graphics

1. On the sender printer, press ↑ or ↓ until the display shows the item you want to download, for example:

```
SELECTIVE TRANS
  SEND FORMAT
```

2. Press Select and then press ↑ or ↓ until you see the number you want to download, for example:

```
  SEND FORMAT
       4
```

3. Press Select. The display prompts you for a number to assign in the receiver printer, for example:

```
   TO FORMAT
       1
```

4. Press ↑ or ↓ until you see the number you want and then press Select. In this example, the display shows:

```
FORMAT 4 TO 1
EXECUTE TEST
```

5. Press Enter to download the item. In this example, you are downloading format 4 from the sender printer to format 1 on the receiver printer.
6. When downloading is complete, the sender printer display shows:

```
SELECTIVE TRANS
  SEND FORMAT
```

You can download another item to the receiver printer, or disconnect the receiver printer and download data to a new receiver printer.

Setting the Maximum Print Speed

The 4630 printer can print up to 8 inches per second (ips) and the 4830 printer can print up to 5 ips. You need to determine the print speed that produces the highest quality labels for your application. For example, if you decide that your printer operates best at 4.0 ips or lower, you may want to set the maximum print speed to 4.0 ips. Setting the maximum print speed enables the printer operator to print at any speed that does not surpass 4.0 ips.

Note: *The Max Print Speed command only limits the print speed range that can be selected from the menu panel. You can still set any print speed (up to 8 ips for the 4630 or 5 ips for the 4830) from the host by using the <SI>S configuration command.*

To set the maximum print speed

1. From the OFFLINE READY display press Menu and then press ↑ or ↓ until you reach the Install menu
2. Press Select and then press ↑ or ↓ until the display shows:

   ```
   INSTALL MENU
   MAX PRINT SPEED
   ```

3. Press Select and then press ↑ or ↓ to select the print speed you want:

   4630 Ranges from 2.0 ips to 8 ips (51 to 203 mm/second).

   4830 Ranges from 2.0 ips to 5 ips (51 to 127 mm/second).

4. Press Enter to activate the new print speed.
5. Press Cont to return to the OFFLINE READY screen.

A

Printer Reference

Use this appendix to find reference information on 4630 and 4830 printers.

Comparing the 4400 to the 4630 and 4830

Features of the 4400 printer and the 4630 and 4830 printers are compared in the table below.

Feature	4400	4630	4830
86XX Emulation	Supported	Not Supported	Not Supported
Audible Alarm	Supported	Not Supported	Not Supported
Image Bands	Supported	Not Supported	Not Supported
Image Memory Standard Additional	 ~~ ~~	 1MB 4MB and 16MB SIMMs	 1MB 4MB and 16MB SIMMs
Maximum Label Width	5.12 in. (130 mm)	6.7 in. (170 mm)	9.0 in. (228 mm)
Maximum Print Speed	10 ips (254 mm/s)	8 ips (203 mm/s)	5 ips (127 mm/s)
Maximum Print Width	4.4 in. (112 mm)	6.4 in. (163 mm)	8.5 in. (216 mm)
Media Sensitivity Numbers	Supported	Not Supported	Not Supported
Parallel Port	Supported	Supported	Supported
Print Length, Standard/Optional	Unlimited	8/98 in. (20/249 cm)	6/98 in. (15/249 cm)
Print Resolution	203 dpi (8 dots/mm)	300 dpi (12 dots/mm)	300 dpi (12 dots/mm)
Printhead Resistance Test	Supported	Not Supported	Not Supported
Serial Ports	1	2	2
Set Printhead Pressure	Supported	Not Supported	Not Supported
Storage Memory Standard Additional	 39K 256K	 128K (2) 1MB and 4MB flash cartridges	 128K (2) 1MB and 4MB flash cartridges
Tests and Service Functions: Printhead, Ribbon Supply, and Take-up Motors	Supported	Not Supported	Not Supported
Coax/Twinax	Supported	Supported	Supported

4630 and 4830 Printer Specifications

This section lists the specifications and performance parameters for the 4630 and 4830 printers.

Communications

Interface	IEEE RS-232C or RS-422
Baud Rate	110, 300, 600, 1200, 2400, 4800, 9600, or 19,200
Character Set	ANSI ASCII character set
Word Length	Selectable 7-bit or 8-bit data format
Handshaking	XON / XOFF (in receive mode only) and CTS / DTR
Input Buffer	Approximately 7000 bytes. XOFF is transmitted and DTR goes low when 750 bytes are available in the buffer. XON is transmitted and DTR goes high when 750 bytes remain in the buffer. Characters are transmitted with no parity from the printer.

Electrical

Power Source	115 / 230 VAC, 50 / 60 Hz, auto ranging, switching power supply.
Circuit Protection	(2) 8 amp, 250V fuses
Grounding	Unit must be connected to a properly grounded receptacle.

Environmental

Operating Temperature	40º F to 100º F (4º C to 38º C)
Storage Temperature	32º F to 120º F (0º C to 49º C)
Humidity	10% to 95% non-condensing
Ventilation	Forced air movement
Dust	Non-conducting, non-corrosive

Fonts

Resident Fonts	21 bitmapped fonts (includes OCR-A and OCR-B) and three smooth scaleable outline fonts.
Optional Fonts	Proportional and monospaced fonts available.
Font Expansion	All fonts expandable vertically and horizontally; fonts and graphics can be printed in four directions: 0°, 90°, 180° and 270°.

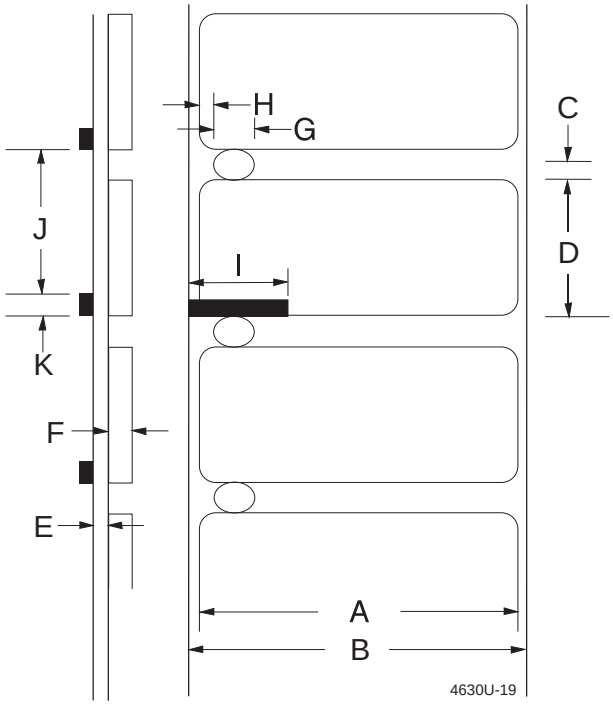
Indicators and Keys

LCD	2 x 16 characters
Control Panel Lights	Alert, On line, Power
Control Panel Keys	Feed / Reload, On line / Off line, Cancel
Menu Panel Keys	Select, Enter, Menu, Cont, ↑, ↓

Media

Width	**4630** 2.0" (50.8 mm) to 6.7" (170.2 mm) **4830** 3.0" (76.2 mm) to 9.0" (228.6 mm)
Thickness	0.0025" (0.0635 mm) to 0.0100" (0.254 mm)
Type	Roll-fed, die-cut continuous, or fan-fold labels, tags or tickets.
Supply Roll	8" (203 mm) maximum diameter on 1.5" (38 mm) to 3" (76 mm) cores
Internal Rewind	Accepts full 8" roll of label or label backing. Rewind spindle accepts standard “core” of 1.5" and 3".
Label Material	Thermal transfer plain-coated papers, vinyl, Mylar, metalized paper, non-woven fabric, fine woven fabric, thermal-visible light scannable paper, infrared scannable paper, thermal ticket / tag stock, thermally sensitive plastic stock.
Thermal Ribbons	Standard widths: 3.0" (77 mm), 4.1" (104 mm), 5.4" (137 mm), 6.7" (170 mm), and 8.6" (218 mm) 4830 only.
Media Sensing	Moveable “see-through” for die-cut labels and reflective for tags with black, carbon-based striping.

Media Dimensions



	4630				4830			
	Max		Min		Max		Min	
Description	**in**	**mm**	**in**	**mm**	**in**	**mm**	**in**	**mm**
A Label width	6.70	170	2.00	51	9.00	229	3.00	76
B Backing width	6.80	173	2.00	51	9.10	231	3.00	76
C Gap between labels	0.5	13	0.10	2.5	0.5	13	0.10	2.5
D Label length	100	2540	0.50	13	100	2540	0.50	13
E Backing thickness	0.005	0.13	0.0023	0.06	0.005	0.13	0.0023	0.06
F Label thickness	0.005	0.13	0.0023	0.06	0.005	0.13	0.0023	0.06
G Width of sensor opening	0.5	13	0.20	5	0.5	13	0.20	5
H Distance from edge of media to edge of sensor	3.25	83	0.20	5	3.25	83	0.20	5
I Reflective sensor mark length	4.00	102	1.0	25	4.0	102	1.0	102
J Distance between reflective mark	100	2540	0.25	6.4	100	2540	0.25	6.4
K Reflective sensor mark width	100	2540	0.10	2.5	100	2540	0.10	2.5

Options

Coax/Twinax Interface Card	For coax connections to an IBM 3270-type computer systems or for twinax connections to IBM midrange computers and AS/400 hosts.
Cutter with Tray	Maximum media thickness of 0.0075" (0.190 mm)—4630 only.
Heavy-Duty Cutter with Tray	For media thicknesses greater than 0.006" (0.152 mm).
Image Memory Expansion	4MB and 16MB memory expansion for faster image processing and printing longer, more complex labels.
Media Rewind Hub	8" (203 mm) maximum outside diameter capacity
Self-Strip Adapter with Label Taken Sensor	Removes media backing from labels, one at a time.
Storage Memory Expansion	1MB and 4MB flash cartridges (maximum 8MB) for storing fonts and graphics.

Physical

Dimensions	**4630** 13.5" H x 12.5" W x 18" D (343 mm x 317.5 mm x 457 mm)
	4830 14.2" H x 15.3" W X 18" D (360 mm x 387 mm x 457 mm)
Weight	**4630** 55 lbs. (24.8 kg)
	4830 64 lbs. (29 kg)

Printing

Type	Direct thermal or thermal transfer
Resolution	300 dots per inch (11.8 dots / mm)
Print Speed	**4630** 2.0" (51 mm) to 8.0" (203.2 mm) per second
	4830 2.0" (51 mm) to 5.0" (127 mm) per second
Bar Code Modules	3.3 mil to 110 mil "X" dimension in picket or ladder orientation
Maximum Print Width	**4630** 6.4" (162.6 mm)
	4830 8.5" (216 mm)
Maximum Print Length	**4630** 10.0" (254 mm) with standard memory
	4830 8.0" (203 mm) with standard memory
	These values are expandable to 64" (1625.6 mm) with the optional on board memory expansion module.
Minimum Print Length	0.5" (12.7 mm)
White Space Slew Rate	2.0" (51 mm) per second to 10.0" (254 mm) per second
Maximum Fields Per Label	200; 10K data per label maximum
Minimum Dot Size	0.0033" (0.084 mm) square
Label Retract	For use with cutter.

Printer Functional Boundaries

Every printer feature has a functional limit that assumes unlimited common memory. Since several functions may compete for common memory, the memory limit may be reached before the functional limit is reached.

For example, even though you have a functional limit of 20 formats, you may run out of memory before you can store 20 formats if you have downloaded several large graphics. In cases like this, you may want to restructure your data or purchase additional printer memory.

Parameter	Functional Limit
Bar Code Height	4 inches
Bar Code Narrow Bar Multiplier	50
Characters in a Field (Including control characters and delimiters)	200
Characters in a Field Name	8
Field Data Offset	9999
Fields in a Format	200
Font Character Size	4 sq. inches
Formats	20 including default
Formats in a Page	26
Graphic Size	3 sq. inches
Graphics	100
Increment or Decrement Skip Value	9999
Languages	9 seven-bit character sets; 2 eight-bit character sets
Length or Width of a Line or Box	9999 dots (50 inches)
Pages	10 including default
Quantity or Batch Size	9999
Slaves to a Field	20
User-Defined Fonts	16

Bar Code Symbologies

This section lists and describes the available bar code symbologies.

Codabar Originally developed in 1972, Codabar is a numeric symbology most commonly used in libraries, blood banks, and air parcel express applications.

Code 2 of 5 Code 2 of 5 is a straightforward numeric symbology developed in the late 1960's. It has been used for warehouse sorting systems, photofinishing envelope identification, and for tracking sequentially numbered airline tickets. All information is contained in the width of the bars; the spaces do not contain information.

Code 11 Code 11 was developed in early 1977 to satisfy requirements for a very high density, discrete numeric bar code. The most extensive application of Code 11 has been for labeling telecommunications equipment.

Code 39 Code 39 is the first alphanumeric symbology ever developed and is the standard non-retail bar code. It is a discrete, self-checking symbology of variable length and is used mostly by the automobile and medical industries.

Code 93 Introduced in 1983, Code 93 was specially designed to complement Code 39. With the correct reading equipment, the two alphanumeric codes may be interchanged throughout a system without making any changes to software.

Code 128 Code 128 was introduced in 1981 as a very high density, alphanumeric symbology. It is a variable length, continuous code that employs multiple element widths.

EAN The European Article Numbering system (abbreviated as EAN) is a numeric superset of UPC. EAN has both a version that uses 8 digits and a version that uses 13 digits. The version with 13 digits encodes the same number of bars as 12 digit UPC Version A, but the 13th digit is encoded into a parity pattern at the left of the center guard bar.

Interleaved 2 of 5 Interleaved 2 of 5 is a high density, self-checking, continuous numeric symbology, which has mainly been used in the distribution industry. Interleaved 2 of 5 actually encodes two digits, one in the bars and one in the spaces.

POSTNET The Postal Numeric Encoding Technique (POSTNET) uses binary digits, represented as full bars and half bars, to provide a numeric bar code symbology that is easily read and decoded by optical reading systems. POSTNET provides both error detection and correction capabilities.

UPC Universal Product Code (UPC) is a subset of EAN. It is a fixed length, numeric, continuous symbology employing four element widths. Two common types of UPC are Version A, which encodes 12 digits, and Version E, which encodes 6 digits. UPC has been used in the supermarket industry since 1973. UPC supplemental code is intended for only periodical issue numbers.

2D Symbologies

2D symbologies provide a more efficient way of encoding data than standard bar code symbologies. 2D symbologies use two dimensions to hold data instead of one, allowing much more information to be stored in a smaller amount of space. Your printer provides the capability for printing both stacked and matrix 2D symbologies.

2D Stacked Symbologies

2D stacked symbologies (such as PDF 417, Code 16K, and Code 49) consist of short linear segments stacked on top of each other. In addition to being able to condense a large amount of information into the stacked format, PDF 417 provides an extensive error detection and correction option. Up to 510 characters can be recovered if they are lost due to an error in scanning or if the label is damaged.

2D stacked symbologies can be scanned with a laser scanner or imaging device that features 2D code scanning capability.

Code 16K Introduced in 1988, Code 16K is an alphanumeric symbology similar to Code 49 in that it employs multiple rows (from 2 to 16). Each row is fixed length and uses a mirror image of the Code 128 coding patterns.

Code 49 Code 49 is an alphanumeric symbology developed in 1987 as a means of labeling very small objects. A Code 49 bar code contains from two to eight adjacent rows, each separated by a one-module separator bar.

PDF417 PDF417 is a stacked 2D symbology that provides the ability to scan across rows of code. Each row consists of start / stop characters, row identifiers, and symbol characters (called “codewords”). Each codeword consists of four bars and four spaces and contain the actual data. In addition to being able to condense a large amount of information into the stacked format, PDF 417 provides an extensive error detection and correction option. Up to 510 characters can be recovered if they are lost due to an error in scanning or if the label is damaged. PDF 417 codes can be scanned with a laser scanner or imaging device that features 2D code scanning capability.

2D Matrix Symbologies

2D matrix symbologies, such as Code One and Maxicode, use both the horizontal and vertical axes to encode data even more efficiently than stacked symbologies. 2D matrix codes are created as a matrix of square elements, with each element being either white or black to encode data in a binary code. Extensive error detection and correction codes are appended to 2D matrix symbologies, often automatically.

2D matrix symbologies generally cannot be read with a laser scanner. Instead, they are read by a digital imager that captures the entire symbol at once instead of scanning each component individually. Since the components of 2D matrix symbologies are decoded after the image is captured, they permit very fast data collection.

Code One Code One is a 2D matrix symbology that stores data directly in a matrix in a checkerboard pattern. This matrix makes Code One especially useful for applications such as small parts labels that do not provide sufficient space for linear bar codes. Code One automatically generates error correction symbol characters that are added to the matrix. In addition to data storage and error correction symbols, each Code One symbol contains a set of horizontal lines in the center, called a finder pattern, that helps readers quickly locate and identify each symbol. Code One symbols also contain vertical reference bars to help readers locate the relative positions of each data bit.

Code One symbols accommodate varying amounts of data using a different method than other codes. Other codes adjust their size to fit the data exactly. Code One symbols are divided into versions, with each version being a specific size. Each version can accommodate an amount of data from one bit to the maximum amount that will fit into that version. If more data is present than the version can accommodate, the printer will not print the symbol.

Maxicode Maxicode is a fixed-size symbology that is made up of offset rows of hexagonal elements arranged around a bullseye finder pattern. Each hexagon represents one bit of information and is either black or white depending on the state of the encoded data bit. United Parcel Service (UPS) Research and Development developed Maxicode for the specific purpose of encoding information about a parcel.

This symbology only encodes very specific data that is divided into the following fields: a 5-digit zip code, a 4-digit zip code extension, a 3-digit country code, a 3-digit class of service, and a string of uppercase letters, numbers, or limited punctuation marks.

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.

4630/4830 Character Table

Use this table to find the correct hex codes for the international character sets listed.

For a selected character set, enter the hex value for the US characters at the right to print the characters below.	# 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	å	¯
Sweden/Finland	#	¤	É	Ä	Ö	Å	Ü	é	ä	ö	å	ü
Spain	£	$	§	¡	Ñ	¿	^	`	°	ñ	ç	~
Italy	£	$	§	°	ç	é	^	ù	à	ò	è	ì
Switzerland	#	$	à	°	ç	é	^	ù	ä	ö	ü	è

Translation Character Table

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

For a selected character set, enter the hex value for the US characters at the right to print the characters below.	! 21	# 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	Å	Ø	#	\	¤	^	`	æ	ø	å	ü
Sweden/Finland	!	Ä	Å	Ö	§	É	¤	^	é	ä	ö	å	ü
Spain	|	Ñ	Pt	@	[	\	]	¬	`	{	ñ	}	¨
Italy	!	£	$	§	°	ç	é	^	ù	à	ò	è	ì
Switzerland	!	#	$	à	°	ç	é	^	ù	ä	ö	ü	è

Extended Character Sets

Each internal font in the printer 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 ØØ	SH Ø1	SX Ø2	EX Ø3	ET Ø4	EQ Ø5	AK Ø6	BL Ø7	BS Ø8	HT Ø9	LF ØA	VT ØB	FF ØC	CR ØD	SO ØE	SI ØF
DL 1Ø	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
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
Ŗ 8Ø	ȧ 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	É C9	CA	CB	CC	CD	CE	CF
DØ	Ñ D1	D2	D3	D4	D5	Ö D6	D7	Ø D8	D9	DA	DB	Ü DC	DD	DE	ß DF
à EØ	E1	E2	E3	ä E4	å E5	æ E6	ç E7	è E8	é E9	EA	ë EB	ì EC	ED	EE	EF
FØ	ñ F1	ò F2	F3	F4	F5	ö F6	F7	ø F8	ù F9	FA	FB	ü FC	FD	FE	FF

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Characters in Fonts: ***c20 (8 point); c21 (12 point); c22 (20 point); c25, c26, c28 (outline fonts); c30-c41 (monospace fonts, 6 point to 36 point)***

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	a AA	« AB	¬ AC	- AD	® AE	- AF
° BØ	± B1	2 B2	3 B3	´ B4	µ B5	¶ B6	· B7	¸ B8	1 B9	0 BA	» BB	1/4 BC	1/2 BD	3/4 BE	¿ BF
À CØ	Á C1	? C2	? C3	Ä C4	Å C5	Æ C6	Ç C7	È C8	É C9	Ê CA	Ë CB	Ì CC	Í CD	Î CE	Ï CF
Ð DØ	Ñ D1	Ò D2	Ó D3	Ô D4	Õ D5	Ö D6	× D7	Ø D8	Ù D8	Ú DA	Û DB	Ü DC	Ý DD	Þ DE	ß DF
à EØ	á E1	â E2	ã E3	ä E4	å E5	æ E6	ç E7	è E8	é E9	ê EA	ë EB	ì EC	í ED	î EE	ï EF
õ FØ	ñ F1	ò F2	ó F3	ô F4	õ F5	ö F6	÷ F7	ø F8	ù F9	ú FA	û FB	ü FC	ý FD	þ FE	ÿ FF

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Characters in Font c23 (OCR A)

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	31	32	33	34	35	36	37	38	39	3A	3B	3C	3D	3E	3F
4Ø	41	42	43	44	45	46	47	48	49	4A	4B	4C	4D	4E	4F
5Ø	51	52	53	54	55	56	57	58	59	5A	5B	5C	5D	5E	5F
6Ø	61	62	63	64	65	66	67	68	69	6A	6B	6C	6D	6E	6F
7Ø	71	72	73	74	75	76	77	78	79	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	C4	C5	C6	C7	C8	C9	CA	CB	CC	CD	CE	CF
DØ	D1	D2	D3	D4	D5	D6	D7	D8	D8	DA	DB	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

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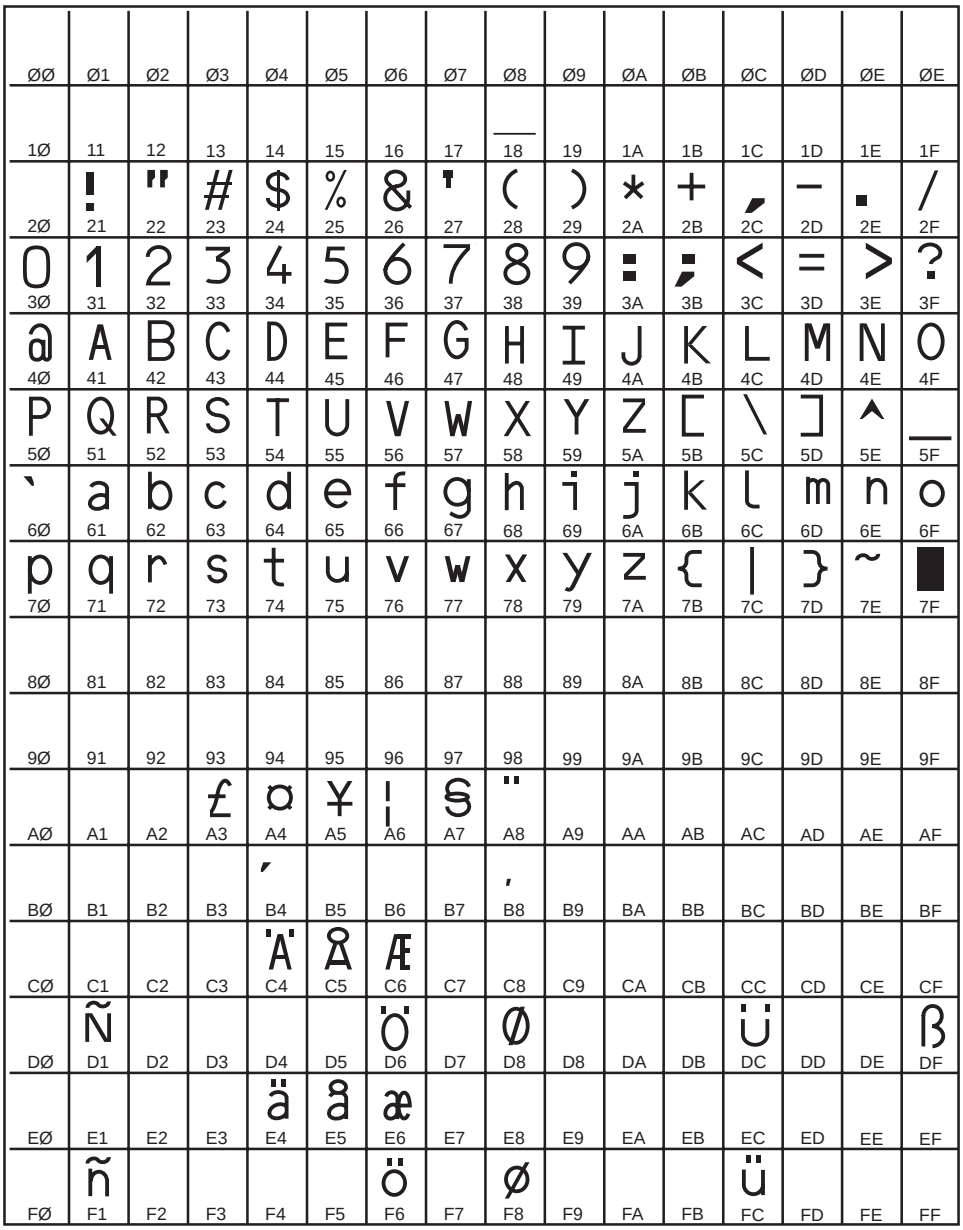
Characters in Font c24 (OCR B Size 2)



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Code Page 850 Character Table

00	01	02	03	04	05	06	07	08	09	0A	0B	0C	0D	0E	0F
10	11	12	13	14	15	16	17	18	19	1A	1B	1C	1D	1E	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 D6	w 77	x 78	y 79	z 7A	{ 7B	| 7C	} 7D	~ 7E	⌂ 7F
Ç 80	ü 81	é 82	â 83	ä 84	à 85	å E6	ç 87	ê 88	ë 89	è 8A	ï 8B	î 8C	ì 8D	Ä 8E	Å 8F
É 90	æ 91	Æ 92	ô 93	ö 94	ò 95	û F6	ù 97	ÿ 98	Ö 99	Ü 9A	ø 9B	£ 9C	Ø 9D	× 9E	ƒ 9F
á A0	í A1	ó A2	ú A3	ñ A4	Ñ A5	a A6	o A7	¿ A8	® A9	¬ AA	½ AB	¼ AC	¡ AD	« AE	» AF
B0	B1	B2	B3	B4	Á B5	Â B6	À B7	© B8	B9	BA	BB	BC	¢ BD	¥ BE	¬ BF
C0	C1	C2	C3	C4	C5	ã C6	Ã C7	C8	C9	CA	CB	CC	CD	CE	CF
ð D0	Ð D1	Ê D2	Ë D3	È D4	ı D5	Í D6	Î D7	Ï D8	D9	DA	DB	DC	DD	Ì DE	DF
Ó E0	ß E1	Ô E2	Ò E3	õ E4	Õ E5	µ E6	þ E7	Þ E8	Ú E9	Û EA	Ù EB	ý EC	Ý ED	- EE	´ EF
- F0	± F1	= F2	¾ F3	¶ F4	§ F5	÷ F6	¸ F7	° F8	¨ F9	· FA	1 FB	3 FC	2 FD	■ FE	FF

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ASCII Conversion Chart

FULL ASCII

Binary[0]	Hex[1]	Dec[2]	C39[3]	Char[4]	Binary	Hex	Dec	C39	Char	Control	Character Definitions[5]
00000000	00	00	%U	NUL	01000000	40	64	%V	@	NUL	Null, or all zeroes
00000001	01	01	$A	SOH	01000001	41	65	A	A	SOH	Start of Heading
00000010	02	02	$B	STX	01000010	42	66	B	B	STX	Start of Text
00000011	03	03	$C	ETX	01000011	43	67	C	C	ETX	End of Text
00000100	04	04	$D	EOT	01000100	44	68	D	D	EOT	End of Transmission
00000101	05	05	$E	ENQ	01000101	45	69	E	E	ENQ	Enquiry
00000110	06	06	$F	ACK	01000110	46	70	F	F	ACK	Acknowledgement
00000111	07	07	$G	BEL	01000111	47	71	G	G	BEL	Bell
00001000	08	08	$H	BS	01001000	48	72	H	H	BS	Backspace
00001001	09	09	$I	HT	01001001	49	73	I	I	HT	Horizontal Tab
00001010	0A	10	$J	LF	01001010	4A	74	J	J	LF	Line Feed
00001011	0B	11	$K	VT	01001011	4B	75	K	K	VT	Vertical Tab
00001100	0C	12	$L	FF	01001100	4C	76	L	L	FF	Form Feed
00001101	0D	13	$M	CR	01001101	4D	77	M	M	CR	Carriage Return
00001110	0E	14	$N	SO	01001110	4E	78	N	N	SO	Shift Out
00001111	0F	15	$O	SI	01001111	4F	79	O	O	SI	Shift In
00010000	10	16	$P	DLE	01010000	50	80	P	P	DLE	Data Link Escape
00010001	11	17	$Q	DC1	01010001	51	81	Q	Q	DC1	Device Control 1 (XON)
00010010	12	18	$R	DC2	01010010	52	82	R	R	DC2	Device Control 2
00010011	13	19	$S	DC3	01010011	53	83	S	S	DC3	Device Control 3 (XOFF)
00010100	14	20	$T	DC4	01010100	54	84	T	T	DC4	Device Control
00010101	15	21	$U	NAK	01010101	55	85	U	U	NAK	Negative Acknowledge
00010110	16	22	$V	SYN	01010110	56	86	V	V	SYN	Syncronous Idle
00010111	17	23	$W	ETB	01010111	57	87	W	W	ETB	End Transmission Block
00011000	18	24	$X	CAN	01011000	58	88	X	X	CAN	Cancel
00011001	19	25	$Y	EM	01011001	59	89	Y	Y	EM	End of Medium
00011010	1A	26	$Z	SUB	01011010	5A	90	Z	Z	SUB	Substitute
00011011	1B	27	%A	ESC	01011011	5B	91	%K	[	ESC	Escape
00011100	1C	28	%B	FS	01011100	5C	92	%L	\	FS	File Separator
00011101	1D	29	%C	GS	01011101	5D	93	%M	]	GS	Group Separator
00011110	1E	30	%D	RS	01011110	5E	94	%N	^	RS	Record Separator
00011111	1F	31	%E	US	01011111	5F	95	%O	_	US	Unit Separator
00100000	20	32	SP	SP[6]	01100000	60	96	%W	`	SP	Space
00100001	21	33	/A	!	01100001	61	97	+A	a	DEL	Delete
00100010	22	34	/B	"	01100010	62	98	+B	b		
00100011	23	35	/C	#	01100011	63	99	+C	c		
00100100	24	36	/D	$	01100100	64	100	+D	d		
00100101	25	37	/E	%	01100101	65	101	+E	e		
00100110	26	38	/F	&	01100110	66	102	+F	f		
00100111	27	39	/G	'	01100111	67	103	+G	g		
00101000	28	40	/H	(	01101000	68	104	+H	h		
00101001	29	41	/I	)	01101001	69	105	+I	i		
00101010	2A	42	/J	*	01101010	6A	106	+J	j		
00101011	2B	43	/K	+	01101011	6B	107	+K	k		
00101100	2C	44	/L	,	01101100	6C	108	+L	l		
00101101	2D	45	/M	-	01101101	6D	109	+M	m		
00101110	2E	46	/N	.	01101110	6E	110	+N	n		
00101111	2F	47	/O	/	01101111	6F	111	+O	o		
00110000	30	48	/P[7]	0	01110000	70	112	+P	p		
00110001	31	49	/Q	1	01110001	71	113	+Q	q		
00110010	32	50	/R	2	01110010	72	114	+R	r		
00110011	33	51	/S	3	01110011	73	115	+S	s		
00110100	34	52	/T	4	01110100	74	116	+T	t		
00110101	35	53	/U	5	01110101	75	117	+U	u		
00110110	36	54	/V	6	01110110	76	118	+V	v		
00110111	37	55	/W	7	01110111	77	119	+W	w		
00111000	38	56	/X	8	01111000	78	120	+X	x		
00111001	39	57	/Y	9	01111001	79	121	+Y	y		
00111010	3A	58	/Z	:	01111010	7A	122	+Z	z		
00111011	3B	59	%F	;	01111011	7B	123	%P	{		
00111100	3C	60	%G	<	01111100	7C	124	%Q	|		
00111101	3D	61	%H	=	01111101	7D	125	%R	}		
00111110	3E	62	%I	>	01111110	7E	126	%S	~		
00111111	3F	63	%J	?	01111111	7F	127	%T[8]	■[9]		

Notes

0 Bit positions are 76543210
1 Hexadecimal value
2 Decimal value
3 Code 39 character(s)
4 ASCII character
5 Hold down Control key and press key to left of definition
6 SP is the SPACE character
7 The Code 39 characters /P through /Y may be interchanged with the numbers 0 through 9
8 May be interchanged with %X or %Y or %Z
9 ■ is the DELETE character

ASCI7x10

B

Communications Reference

This chapter provides information on interfaces and protocols for integrating your printer into a data collection network.

Communication Protocols

The printer supports the flow control and block transfer protocols described in this section (all are Point-to-Point protocols except Multi-Drop protocol). Application programs and ROM BIOS determine which protocols your computer can support. For more detailed information, refer to the Intermec *Data Communications Reference Manual* (Intermec P/N 044737).

Intermec "Standard"

Intermec "Standard" protocol is a proprietary block transfer/status response protocol. Except for single character status commands (<ENQ> and <VT>), data is transmitted in message blocks beginning with the start of text (<STX>) character and ending with the end of text (<ETX>) character. Message blocks can be up to 255 or 512 characters, including the start of text and end of text 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.

Printer status conditions in descending order of priority, status response characters, and pin 11/20 states are shown in the following table.

Printer Status	Character	Pin 11/20
Buffer Already Full	GS	Busy
Ribbon Fault	US	Busy
No Label Stock	EM	Busy
Buffer Now Full	DC3	Busy
Printhead Hot	SI	Busy
Offline (Paused)	DC3	Busy
Label at Strip Pin	FS	Ready
Skipping	DC1	Ready
Printing	DC1	Ready
Ready/Online	DC1	Ready

***Note**: Do not confuse the DC1 and DC3 status characters in "Standard" protocol with the XON/XOFF software flow control characters.*

When the printer returns Buffer Now Full (<DC3>) status, the currently received message block is accepted. 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 entire message block has been discarded.

XON/XOFF

When you select the XON / XOFF protocol, software and hardware flow control are concurrently enabled. Software flow control uses the ASCII characters <DC1> (XON) and <DC3> (XOFF) to start and stop the flow of data from the host to the printer. Hardware flow control uses pin 20 on the printer's serial port to indicate "Ready" or "Busy" for data flow control. Status responses conform to the table on the preceding page except that <DC2> is substituted for <DC1> and <DC4> is substituted for <DC3>.

Pin 20 reports "Ready" and a <DC1> (XON) is transmitted when the printer finishes reloading at power-up. It reports "Busy" when the printer's input buffer fills with 3116 bytes of data. If the host ignores pin 20 and continues to transmit data, the printer transmits a <DC3> (XOFF) after receiving 15 additional characters. The printer continues to transmit a <DC3> after every 15 characters received if the host continues to transmit data. Data integrity is not guaranteed if this happens.

Pin 20 becomes "Ready" when the printer has transferred all the data from the input buffer. If a <DC3> was sent, the printer transmits a <DC1> (XON) and the host may resume transmission. When the printer is switched to Offline, pin 20 becomes "Busy" and a <DC3> is transmitted. When the printer is switched to Online (and the input buffer is empty), pin 20 becomes "Ready" and a DC1 is transmitted.

Printer XON / XOFF operation is shown in the following state table:

# of Bytes Received	Online/ Offline	Pin 20	Transmit
Don't Care	Offline	Busy	DC3
3116	Online	Busy	
3116 + each 15	Online	Busy	DC3
thereafter			
Buffer Empty	Online	Ready	DC1 (if DC3 was sent)

***Note:** Hardware flow control does not work with a multi-drop or modem connection.*

<STX> and <ETX> are optional with XON / XOFF, which lets you use them for comments or other characters that you want the printer to ignore. If an <ETX> is downloaded, the printer will ignore all the data between it and the next <STX>. Once the <STX> is downloaded, the printer starts reading the data again.

XON/XOFF, No Status

This protocol is identical to XON / XOFF protocol except that status is not returned after each message received. However, status is still returned for the status request (<ENQ>) and the status dump (<VT>) commands.

Polling Mode D

Polling Mode D is a block transfer protocol (Intermec proprietary) that transmits data in blocks of up to 255 characters, including protocol overhead. The blocks are framed with LRC characters for additional data integrity. Polling Mode D is normally used for point-to-point networks that connect the printer to an Intermec port concentrator (RS-232C or RS-422 are acceptable). This protocol is enabled from the printer.

Multi-Drop

Multi-Drop lets you connect up to 32 devices to an Intermec controller on a four-wire RS-485 (two twisted pair). This protocol is similar to Polling Mode D except each device has a unique address (POL and SEL character). You must use an RS-485, which is automatically enabled when you enable Multi-Drop. Be sure to specify a unique address for the printer and verify that the baud rate is between 2,400 and 19,200.

Host Requirements

The 4630 and 4830 printers have 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 must be available on the host (unless I/O options are installed) if you are connecting it directly to the printer.
- The host must support at least one of the following data communications interfaces: EIA RS-232, RS-422, or RS-485.

For information about configuring the host or the controller, refer to the manual for that device.

Communication Protocol Characters

The following table shows the characters available for different protocols. Refer to the protocol you are using for your system.

Protocol Characters	Standard	XON/XOFF	Polling Mode D	Multi-Drop
Select In			GS	GS
Poll In			FS	FS
Reset In			EOT	EOT
Request for Acknowledgment In			ENQ	ENQ
Start of Message In	STX	STX	STX	STX
End of Message In	ETX	ETX	ETX	ETX
Acknowledgment In			ACK	ACK
Negative Acknowledgment In			NAK	NAK
Data Line Escape In	DLE	DLE	DLE	DLE
XON In		DC1		
XOFF In		DC3		
Select Out				GS
Poll Out				FS
Reset Out			EOT	EOT
Request for Acknowledgment Out			ENQ	ENQ
Start of Message Out			STX	STX
End of Message Out			ETX	ETX
Acknowledgment Out			ACK	ACK
Negative Acknowledgment Out	NAK		NAK	NAK
Data Line Escape Out	DLE	DLE	DLE	DLE
XON Out		DC1		
XOFF Out		DC3		
Status Enquiry In	ENQ	ENQ		
Status Dump In	VT	VT		
Timeout on EOM ACK			20 (DEC)	20 (DEC)

Communication Boundaries

The information below applies to all the printer supported protocols.

Parameter	Maximum Capacity
Printer buffer in bytes	2096 (Standard protocol) 3372 (XON / XOFF, READY / BUSY)
Number of bytes in the buffer when the printer stops accepting data.	1841 (Standard Protocol) 3116 (XON / XOFF, READY / BUSY)
Number of bytes in the buffer when the printer resumes accepting data.	1840 (Standard) 2604 (XON / XOFF, READY / BUSY)
Message block size	255, 512 (Standard, Polling Mode D, Multi-Drop)
Receivable characters after "Busy"	256
Message delay	9999 ms
Character delay	9999 ms
Device Address number (Multi-Drop only)	A to Z, 0 to 5

Communication Interfaces

The printer supports serial communications with the following EIA interfaces: RS-232C, RS-422, RS-485.

RS-232C The RS-232C serial interface is used in all asynchronous point-to-point full- or half-duplex direct data communications or modem control. The cable connected to the printer must have the pin assignments listed in the following table to operate properly under RS-232.

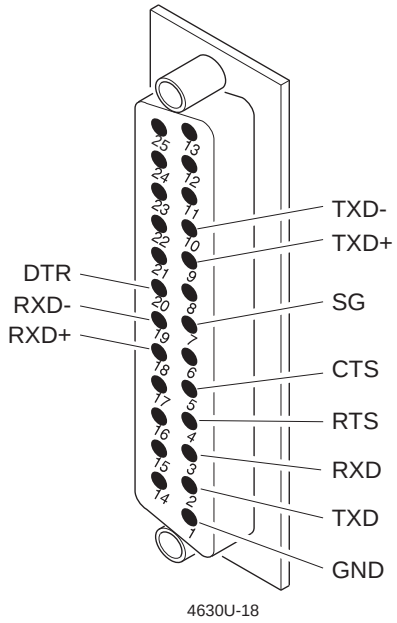
RS-422 The RS-422 interface is used in long line point-to-point direct connect installations. The cable connected to the printer must have the pin assignments listed in the following table to operate properly under RS-422.

RS-485 The RS-485 serial interface is used for multi-drop installations only. The cable connected to the printer must have the pin assignments listed in the following table to operate properly under RS-485.

Printer Serial Ports

The serial port connectors are located on the printer's rear panel. They are 25-pin "D" style subminiature receptacles. The RS-232/422/485 ports are wired as a data terminal equipment (DTE) device.

Pin	Description
1	Chassis ground (shield)
2	TXD (RS-232)
3	RXD (RS-232)
4	RTS (4.7kΩ to +5VDC)
5	CTS (input)
7	Signal ground
9	TXD + (RS-422)
10	TXD - (RS-422)
18	RXD + (RS-422)
19	RXD - (RS-422)
20	DTR (output)



Unlisted pins are not used.

Interface Cables and Connectors

There are many different cabling options available with the printer. Your choice of cabling depends on the network configuration, hardware interface, protocol used, cabling distance, and the electrical and environmental conditions in which you are operating the printer. For typical installations, Intermec recommends the following:

- Shielded cable, minimum 24 gauge
- 25-pin "D" style subminiature connector with metal backshell
- Cable shield connected to metal backshell
- EIA RS-232, RS-422, or RS-485 electrical interface

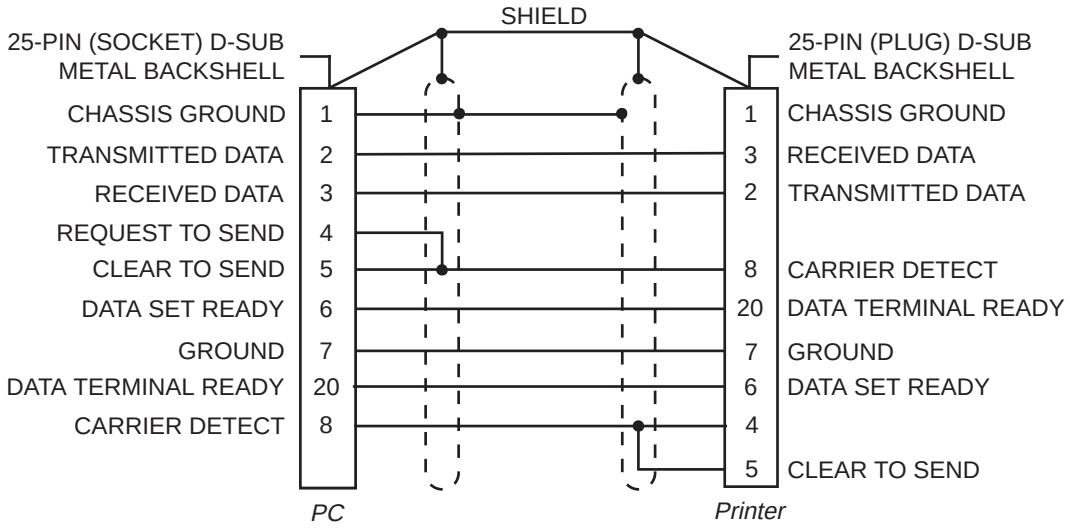
Intermec Cables

Intermec offers a full line of interface cables. These cables are not included with the printer and must be ordered separately. Refer to the Intermec Product Catalog for RS-232 cables or contact your Intermec representative for more information.

Cable Schematics

The following diagrams show cable schematics for some of the more commonly used cables.

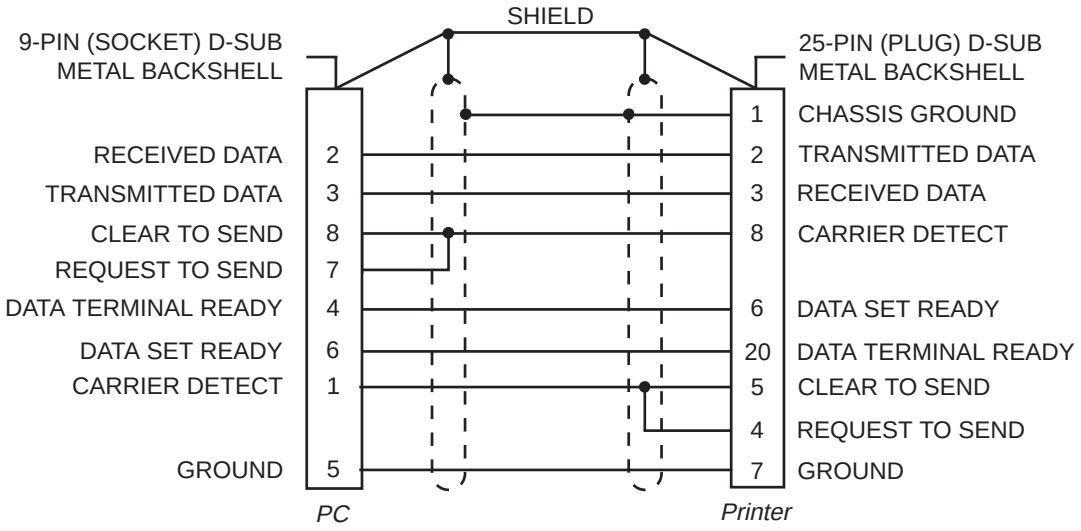
RS-232 Null Modem Cable for PC with 25-Socket Serial Port



Note: The metal backshell is connected directly to the shield to achieve electrostatic discharge (ESD) immunity.

4630U-33

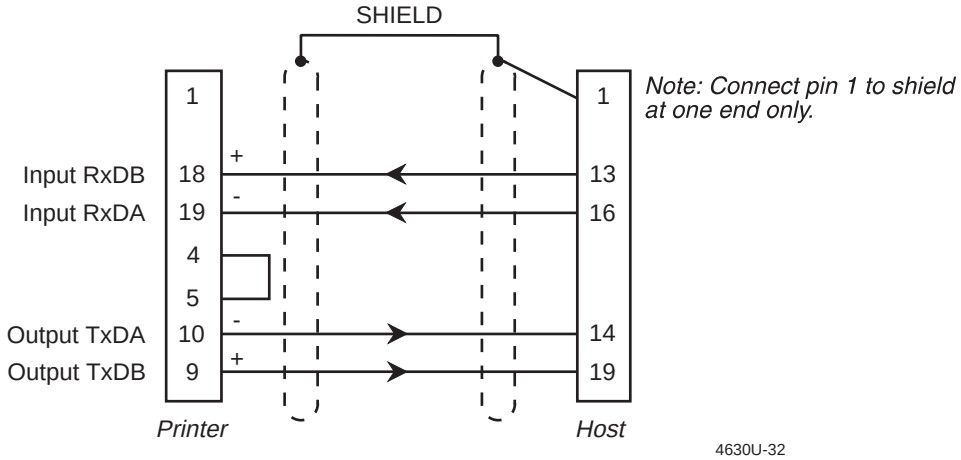
RS-232 Null Modem Cable for PC with 9-Socket Serial Port



Note: The metal backshell is connected directly to the shield to achieve electrostatic discharge (ESD) immunity.

4630U-34

RS-422/RS-485 Multi-Drop Cable



Note: Connect pin 1 to shield at one end only.

4630U-32

G

Glossary

ASCII
American Standard Code for Information Interchange. A standard, 7-bit character code used for computing.

Backing
Silicon release liner on media to which labels are attached until ready for use.

Bar Code
A printed machine-readable code that consists of parallel bars of varied width and spacing.

BEL
A character that sends an error message.

Character Set
Refers to specific letters, numerals, and symbols that support a particular language (For example, French, US ASCII).

Cloning
A procedure that copies the RAM contents (configuration, formats, fonts, pages and graphics) from the memory of one printer to the memory of another.

Configuration
The current settings that determine the operating characteristics of the printer.

Control Panel
A panel on the printer containing the operating keys, liquid crystal display, and indicator lights.

Cutter
An optional device for the printer that cuts individual labels and drops them into a tray.

Data File
The collection of data and printer commands that, when sent to the printer, is merged with a format file to print a label.

Data Line Print
A mode of operation in which the printer prints each command (accompanied by its ASCII code) that it receives from the host.

Density
The amount of information encoded in a given area.

Direct Thermal
A method of thermal printing in which images are printed when heat from the thermal printhead produces a black mark on the media.

Display
Two-line screen on the control panel that displays messages such as printer status, menus, commands, and errors.

Drag
A method of bar code printing in which all the bars are printed at once, in parallel. The bar code appears across the width of the label.

EAN
European Article Numbering. A bar code used widely in Europe.

Field
A graphic element that is the basic unit of a format. The four basic types of fields are bar code, graphic, line, and text.

Fixed Data Field
Bar code and text fields that never vary from one label to the next; the data in a fixed field is a permanent part of the format.

Fixed Format
A format in which the data never varies from one label to the next such as a return address label. A fixed format needs no additional data to print a label.

Font
A character set of a given type size and style. See also Character Set.

Font File
See Soft Font.

Form Feed
A printer control panel button that advances the media.

Format File
The arrangement of fields on a label.

Graphic
A bitmap picture downloaded to the printer by the host before printing.

HIBC
Health Industry Bar Code.

Human-Readable
See Text.

Imaging
The process of generating a picture of the label in printer memory.

Increment/Decrement Field
Bar code or text fields the printer automatically changes from one label to the next. For example, a batch of labels with serial number text or bar code fields, that change from 001, to 002, to 003, and so on.

Index
To move from the start of the label to the start of print. With continuous media, to advance the media over the “label gap” to the “edge” of the next label.

Interpretive Field
A text field that describes the data in the associated bar code field.

ISO
International Organization for Standardization. An internationally accepted 7-bit character code. (The US version is ASCII.)

IPS
Inches per second. A measurement of print speed that measures the number of inches of media that is printed each second.

Label
The part of the media on which data is printed.

Label Gap
The space between labels on die-cut label stock.

LCD
Liquid crystal display. A display comprised of groups of transparent anisotropic liquid segments that are sandwiched between two transparent electrodes. Application of an electric field across a segment changes the reflectivity of the liquid and it becomes opaque.

Margin
The distance between the edge of a label and where the printing starts on that label. See also Top-of-Form.

Media
The label stock on which the printer prints labels. Media can be made of plain paper, polyester, thermally reactive paper, or other materials with adhesive backing.

Media Rewind Hub
A device that rewinds media and media backing. It is useful for printing batches of labels and works with the self-strip printer option.

Menu
A list of commands accessible through the Menu Panel on the printer. Menus contain submenus and selections of printer features.

Mnemonic Code
An acronym or abbreviation for a computer instruction, routine or format. For example, <STX> represents the start of text.

Multi-Drop
A protocol capable of controlling communications between a single controller and multiple devices.

Nibblized
A software term that refers to grouping bits into sets of four, called nibbles. Usually bits are grouped into sets of eight, called bytes.

OCR Font
A font that is recognized by optical character recognition.

Offline
The state in which the printer is not able to carry out two-way communication with the host.

Online
The state in which the printer is able to carry out two-way communication with the host.

Page
A group of labels that are always printed together. When labels on a page share the same data, it reduces the number of commands that must be sent to the printer.

Parallel
A communication scheme in which the bits of a byte are transferred simultaneously over a multistrand cable.

Parameters
The operating limits of the printer.

Picket
A method of bar code printing in which the bars in the bar code are printed one at a time, in a series. The bar code appears along the length of the label.

Pitch
(1) The number of characters printed in one horizontal inch determined by the increment by which the printer platen moves. (2) Rotation of a bar code symbol about an axis parallel to the direction of the bars.

Point Size
Font height; 72 points equals 1 inch as measured from slightly above the top of the uppercase letters to slightly below the bottom of the lowercase descenders.

Polling Mode D
A protocol capable of controlling communications between multiple devices and a single multiport controller.

Print Speed
Measured in inches per second (IPS), the rate at which media travels past the printhead.

Printhead
The mechanism inside the printer that prints.

Printhead Elements
The parts of the printhead that print by placing a mark on the label when heated. Each element is switched on and off separately in order to react with the media or thermal transfer ribbon to create a mark on the label.

Printhead Range
The range over which the resistance of the wires that carry energy to the printhead elements can vary before sending a warning. The wires are tested with each Printhead Test.

Printhead Test
A test that takes place each time the printer is turned on, or receives a specific command from the host. This test makes sure the resistance of the wires that carry energy to the printhead elements are within the acceptable range, which ensures the temperature of the elements is within the acceptable temperature range.

Ready
The state in which the printer is able to print; the normal operating state of the printer.

Ready/Busy Line
Pin 11 of the rear panel connector. Indicates the printer is ready or not ready.

RS-232
Standard for serial binary data interchange. The standard covers the physical, electrical, and functional characteristics of the interface.

RS-422
Standard for the voltage and impedance levels for serial data transmission on balanced lines.

RS-485
Standard for allowing multiple devices to share a common set of serial data communication lines. The signaling is very similar to RS-422. The maximum number of devices allowed is 32.

Scan
To read a bar code with a device known as a scanner, which converts optical information into electrical signals.

Scannable
A symbol that can be successfully scanned and correctly decoded.

Selective Transfer
A procedure that copies selected formats, fonts, graphics, or pages stored in the memory of one printer to the memory of another.

Self-Strip
An optional device for the printer that presents each label after it is printed, with the backing removed so it may be applied immediately.

Sensitivity
The responsiveness of thermal media, or of thermal transfer ribbon, to heat; it is determined by the time required for a unit measure of heat to affect the media or ribbon.

Serial
A communication scheme in which the bits of a byte are transferred one at a time.

Skip
To move the paper at slew speed to the next label.

Soft Font
A file stored in the printer to provide the ability to print text using fonts that are not resident in the printer.

Standard Protocol
A communications protocol capable of controlling communications between two devices connected by a single data communication line.

Symbology
A scheme for encoding data as bar code. Code 39, Interleaved 2 of 5, and Codabar are examples of different symbologies.

Thermal Transfer
A method of printing by which heat from the printhead melts ink from the ribbon onto media. The ink adheres to the media as it cools.

Top-of-Form
The point at which printing can start on a label. Separated from the edge of the label by the margin.

UPC
Universal Product Code. Bar code used widely in the United States.

User-Defined Characters (UDC)
See Graphic.

User-Defined Fonts (UDF)
See Soft Font.

Variable Data Field
Bar code and text fields that change from one label to the next.

XON/XOFF
A protocol that stops the host from sending data when the printer buffer fills up and starts it again when the buffer empties.

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