



E-4203 / E-4204 / E-4304
Operator's Manual

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UL1950 Information Technology Equipment
C22.2 No. 950-M93

EN60950



For 230 Volt Operation (Europe): Use a cord set, marked "HAR," consisting of a min H05VV-F cord which has a minimum 0.75 square mm diameter conductors, provided with an IEC 320 receptacle and a male plug for the country of installation rated 6A, 250V

Für 230 Volt (Europa): Benützen Sie ein Kabel, das mit "HAR" markiert ist, bestehend mindestens aus einem H05VV-F Kabel, das mindestens 0,75 Quadratmillimeter Drahtdurchmesser hat; sowie eine IEC320 Steckdose und einen für das Land geeigneten Stecker, 6A, 250 Volt.

As an Energy Star Partner, the manufacturer has determined that this product meets the Energy Star guidelines for energy efficiency.



The manufacturer declares under sole responsibility that this product conforms to the following standards or other normative documents:

EMC: EN 55022 (1993) Class A
EN 50024 (1998)

Safety: This product complies with the requirements of EN 60950 /A11:1997



Gost-R

FCC: This device complies with FCC CFR 47 Part 15 Class A.

- Note:** This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy, and if not installed and used in accordance with the instructions in this manual, it may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Important Safety Instructions

This printer has been carefully designed to give you many years of safe, reliable performance. As with all electrical equipment, there are a few basic precautions you should take to avoid hurting yourself or damaging the printer:

- Carefully read the installation and operating instructions provided with your printer.
- Read and follow all warning instruction labels on the printer.
- Place the printer on a flat, firm, solid surface.
- To protect your printer from overheating, make sure all openings on the printer are not blocked.
- Do not place the printer on or near a heat source.
- Do not use your printer near water, or spill liquid into it.
- Be certain that your power source matches the rating listed on your printer. If you are unsure, check with your dealer or with your local power company.
- Do not place the power cord where it will be walked on. If the power cord becomes damaged or frayed replace it immediately.
- Do not insert anything into the ventilation slots or openings on the printer.
- Only qualified, trained service technicians should attempt to repair your printer.

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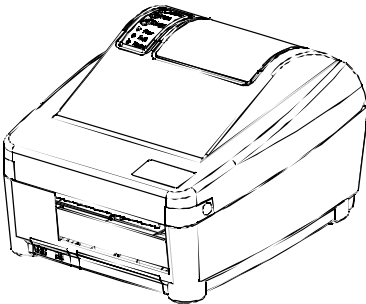
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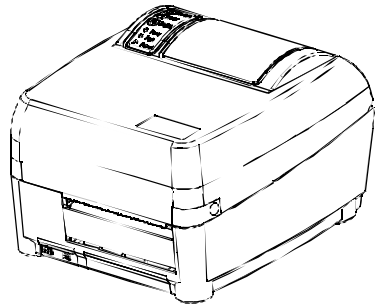
Printer Overview

1.0 Introduction

The E-4203, E-4204, and E-4304 hereafter referred to as ‘the printer’, is a user-friendly printer that blends quality and durability at an affordable price. The front panel was designed to make operation of the printer a simple task. The printer offers direct thermal and optional thermal transfer printing as well as RS232 serial and parallel interfaces for ease of connection to your host system.



Direct Thermal Model



Thermal Transfer Model

This manual provides all the information necessary to operate the printer.

To print labels or tags simply refer to the instructions included with the software you have chosen to create the labels. A Windows™ printer driver can be found on our website (www.datamaxcorp.com) or on the Datamax Accessories CD.

If you wish to write a custom program, a copy of the *E-Class DPL Programmer's Manual (88-2265-01)* is included on the Datamax Accessories CD.

1.1 About this Printer

This printer offers the following standard and optional features:

1.1.1 Standard Features

Printing

- Direct Thermal Printing
- On Demand and Batch Printing
- 203 or 300 DPI Printhead (*Model Dependant*)
- AGFA Scalable Font Engine

Memory

- 1 MB FLASH memory
- 2 MB DRAM Memory

Interfaces

- This printer is equipped with an RS-232 serial interface and a Centronics parallel interface.

Operational

- Simple Media Loading
- Media Tearbar
- Fan-fold media compatible from rear of printer
- 1" (25mm) internal media supply core

1.1.2 Optional Features

Thermal Transfer

Thermal transfer printing requires the use of a ribbon. The ink/wax from the ribbon transfers to the media by the printer to create an image. Thermal transfer printing provides exceptional clarity and scanability.

External Cutter

The external cutter provides ease of automatic cutting for tags and labels after a label is printed. This feature attaches to the front of the printer.

Present Sensor

The present sensor allows the printer to be configured for "one up" printing. With the sensor installed, the printer will not print the next label until the previous printed label has been removed from the printer.

FLASH Memory Expansion

FLASH Expansion cartridges are used for permanent storage of custom fonts, formats and graphics. The FLASH memory cartridges cannot be used in conjunction with the ILPC option

External Media Supply Stand*

The external media supply option allows the use of large media supply rolls, up to 8-inches in diameter, on 1–3" cores.

ILPC

International Print Capability consisting of one of the following:

- CG-Times (western European) Scalable font
- Kanji Gothic B Scalable font
- Simplified Chinese GB Scalable font

Heavy Duty Power Supply

This optional power supply is available for use in high demand applications. This power supply will also increase the E-4203's print speed capability to 4 IPS.

* Not available for the E-4304



Getting Started

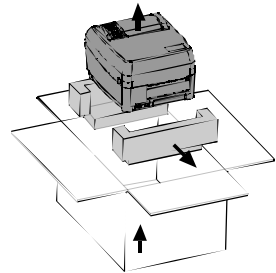
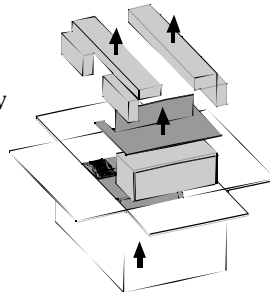
2.0 Before using the Printer

Removing the Packaging

Inspect the shipping container(s) for damage, if damage is evident notify the shipping company to report the nature and extent of the damage.

The printer is carefully packaged to avoid any damage during transit. In order to operate the printer you will need to remove the packaging materials, (i.e., tape and foam) that were placed in the printer for shipment. Complete the following steps prior to connecting power or attempting to load media.

- Open the box, (make sure the arrow on the box is pointing up).
- Remove packing foam, cardboard divider, and power supply box.
- Lift the printer from its box and remove the packing foam.
- Remove the plastic bag from the printer.

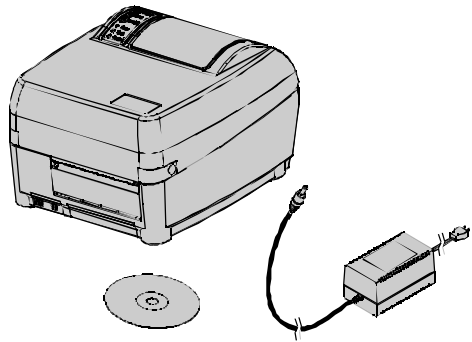


Note: It is a good idea to save the carton and packaging materials in the event shipping the printer is ever required.

Inspecting the Printer

After removing the printer from the packaging material, check the contents of the package. The following items should be included:

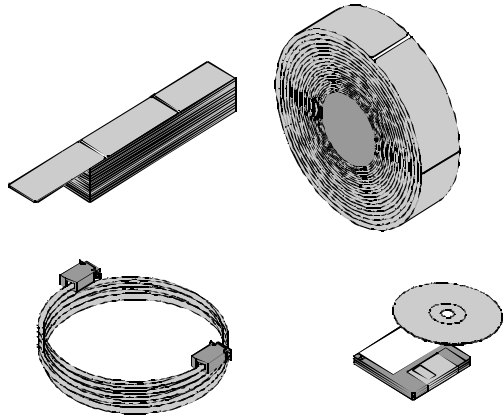
- Printer
- External power supply
- Accessories CD
- Special or additional items purchased.



Additional Requirements

The following items are necessary for generating labels from your printer. Contact your customer support representative for advice on which media and software is best suited for your needs.

- Serial or parallel cable
- Applicable media
- Applicable software





Setting up the Printer

3.0 Introduction

This chapter explains how to connect your printer, load media and ribbon (optional), and print a configuration label.

3.1 Connecting the Printer

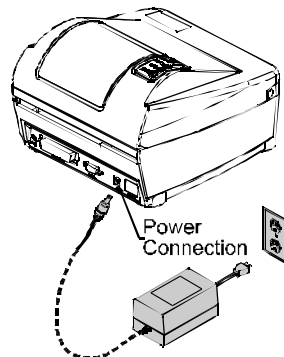
3.1.1 Power Connection

The printer is powered from an external power supply that connects to the printer as shown below. Several power supplies are available depending on your printer model.

Model	DPI	Print Speed	Media Roll Diameter	Power Supply*
E-2303	203	3 IPS	4"	Standard (Non Auto-Ranging) 110V: 50-2024-01 220V: 50-2034-01
E-4203 with 4 IPS Option	203	4 IPS	4"	Standard (Auto-Ranging) 50-2050-01
E-4204	203	4 IPS	5"	Standard (Auto-Ranging) 50-2050-01
E-4304	300	4 IPS	5"	Standard (Auto-Ranging) 50-2050-01

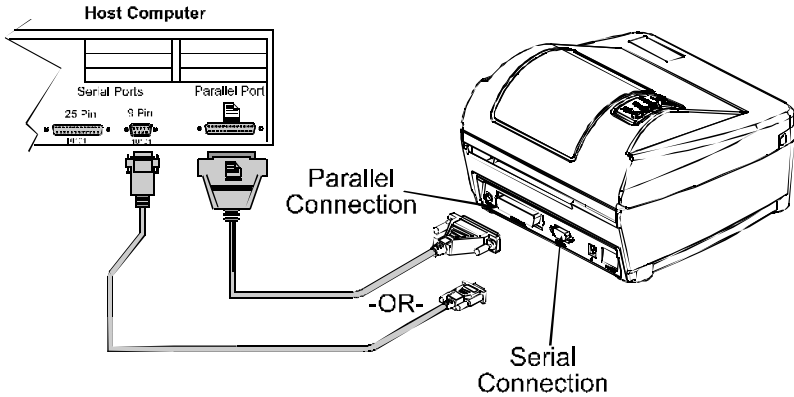
* The optional Heavy Duty Power Supply (50-2049-01) can be used for high demand applications with any of the above printer models.

Ensure that the power supply shipped with your printer is compatible with your electrical service.



3.1.2 Interface Connection

The printer can be connected to the host via a **serial** or **parallel** cable.



3.1.3 Interface Cables

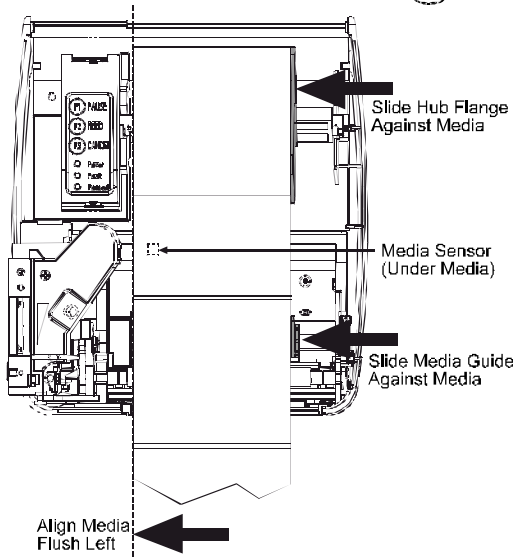
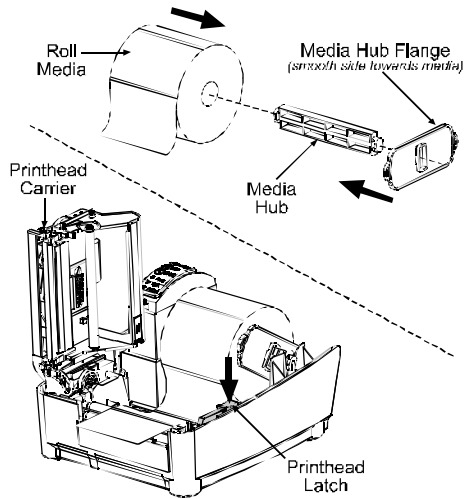
An interface cable is necessary to connect the printer to the host. The interface between the printer and the host will be either a serial RS-232C or parallel cable. Cable configurations for serial (RS-232C) interfaces are shown below, (contact your reseller for part numbers and ordering information).

Host DB-9S	Printer DB-9P	Host DB-25S	Printer DB-9P
TX 3	2 RX	TX 2	2 RX
RX 2	3 TX	RX 3	3 TX
CTS 8	7 RTS	CTS 5	7 RTS
DSR 6	1 DTR	DSR 6	1 DTR
GND 5	8 CTS	GND 7	8 CTS
DTR 4	5 GND	DTR20	5 GND
Shield	Shield	Shield	Shield
Part# 32-2300-01		Part# 32-2301-01	

The printer can also be connected to the host with a parallel connection. In addition, the printer has a unique feature where if you connect both the serial and parallel cables to the printer at the same time, the printer will automatically interface to the first connection, (serial or parallel) that transmits valid data. After a connection has been made, the printer must be turned off and then back on again to change the interface connection.

3.2 Loading Media

1. Open the cover.
2. Push the Printhead Latch down and raise the Printhead Carrier Assembly.
3. Place a roll of media (labels facing up) on the Media Hub and insert them into the printer. Slide the Media Hub Flange with its smooth side towards media onto the Media Hub.
4. Route the media as shown below.

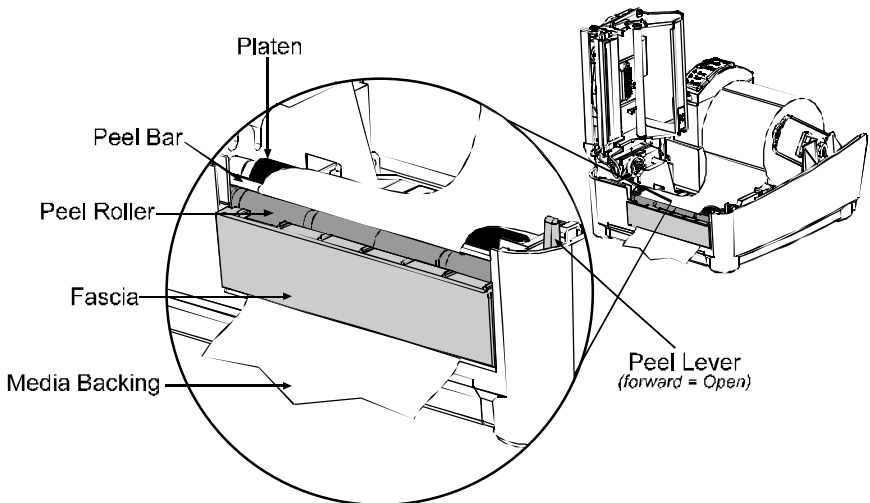


5. Slide the Media Guide and Hub Flange to the edge of the media.
6. Close the Printhead Carrier Assembly and press down until it locks into place.
7. Close the cover and press the 'Feed' button several times to feed the media and ensure proper tracking. If the printer does not correctly sense the top of each label it may be necessary to perform the Calibration Procedure, Section 4.6.

Note: The printer is factory set for 4-inch media and ribbon, when using different width media/ribbon please refer to Chapter 5.

3.2.1 Loading Media for Peel Configuration

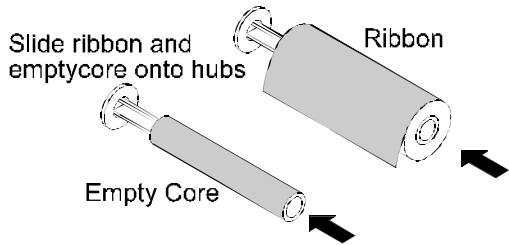
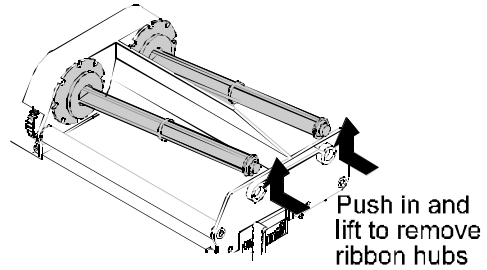
1. Open the cover.
2. Push the Printhead Latch down and raise the Printhead Carrier Assembly.
3. Place a roll of media (labels facing up) on the Media Hub and insert them into the printer. Slide the Media Hub Flange with its smooth side towards media onto the Media Hub.
4. Pull the Peel Lever forward to the 'Open' position.
5. Remove 6" (152 mm) of labels from the backing. Route the Media Backing over the Platen and Peel Bar and behind the Peel Roller and Fascia as shown below.



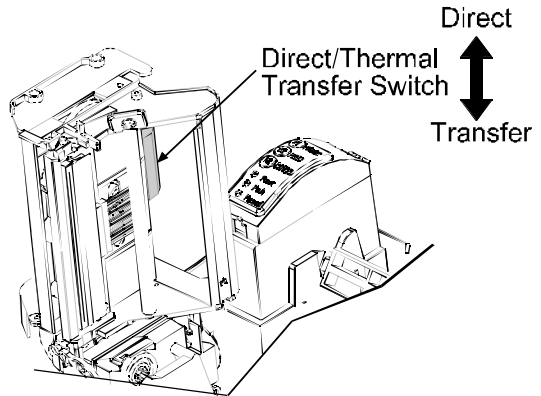
6. Push the Peel Lever back to the 'Closed' position
7. Close the printhead carrier assembly and press down until it locks into place.
8. Close the cover and press the 'Feed' button several times to feed the media and ensure proper tracking. The labels will separate automatically as it is feed through the printer. If the printer does not correctly sense the top of each label it may be necessary to perform the Calibration Procedure, Section 4.6.

3.3 Loading Ribbon (Thermal Transfer)

1. Open the cover.
2. Remove the two ribbon hubs.
3. Slide a roll of Ribbon onto one of the Ribbon Hubs and an Empty Core onto the other hub.

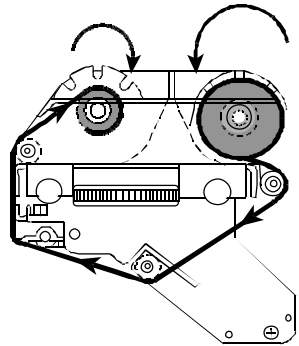
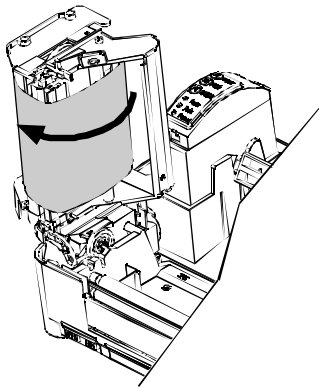
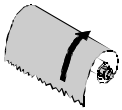


4. Push the Printhead Latch down and raise the Printhead Carrier Assembly.
5. Slide the Direct/Thermal Transfer switch to the 'Transfer' position.



6. Place the Ribbon Hubs back into the printer and route the ribbon through the printhead carrier assembly as shown below.

Wrap end of ribbon
around empty
core on Hub



Right Side View

Note: Always make sure the ink side of the ribbon faces the media and **NOT** the printhead.

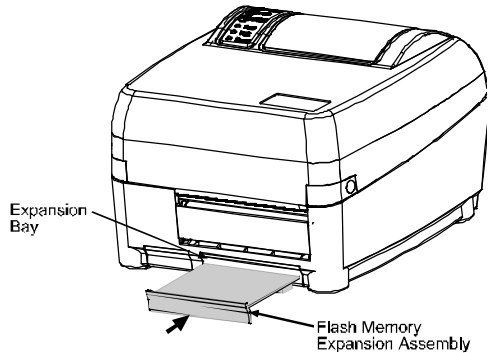
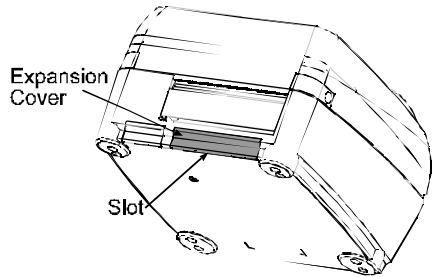
7. The 'Media Type' setting within the printer's setup must be set to 'Thermal Transfer' to print using a ribbon. See Section 4.4.

3.4 Flash Memory Expansion

The printer can be equipped with an optional Flash Memory Expansion. This flash expansion can be used for storage of label formats and fonts. For font downloading instructions refer to Section 5.8 in this manual.

To install the Flash Memory Expansion:

- 1 Turn the power off and unplug the printer. Remove any installed media from the printer.
- 2 Using a coin, flathead screwdriver, or similar object, insert it into the Slot on the underside of the printer and gently pry the Expansion Cover off the printer.
- 3 With the Flash Memory Expansion Assembly oriented as shown (connector down), gently insert it into the Expansion Bay until the assembly is firmly seated.



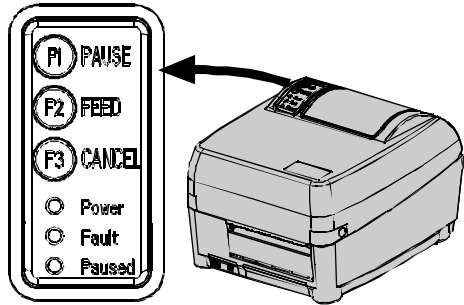
Note: When using a blank expansion module for the first time the printer will automatically format it when the printer is powered up. This initial format can take up to one minute.

4

Using the Front Panel

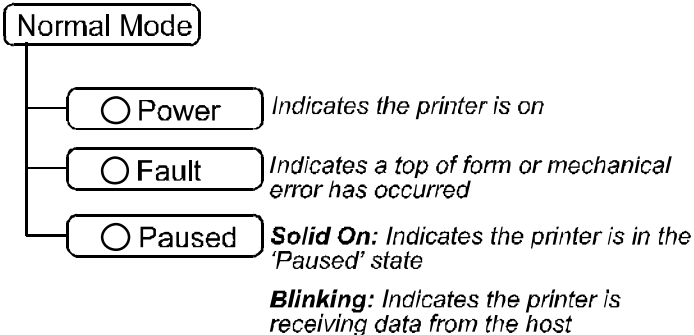
4.0 Front Panel Operation

The Front Panel consists of three lights and three dual-function buttons. The functions of these lights and controls are listed below.



4.1 Lights

(Normal power-up)



- Both the POWER and PAUSED lights will be on during power-up initialization, or “warm reset”.

4.2 Buttons

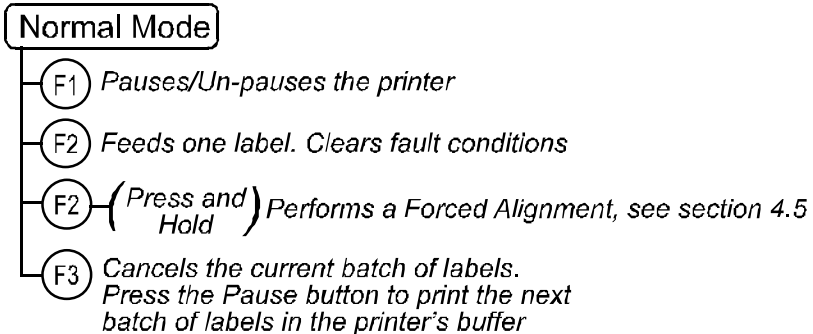
Three buttons perform different functions based on the mode the printer is in. The printer operates in one of the following modes:

- Normal:** Normal printer functions (i.e. Pause, Feed, and Cancel). See Section 4.3
- Printer Setup:** Allows setting of the printer's operating menu items (i.e. Media Settings, Communications, and Options). See Section 4.4
- Calibration:** Allows the printer to 'calibrate' the media for sensing of the Top of Form. See Section 4.6

4.3 Normal Mode - Button Functions

In 'Normal Mode' the printer's buttons control normal operations such as Pause, Feed, and Cancel as well as test and reset functions by using button combinations.

(Normal power-up)



Button Combinations *(push buttons simultaneously)*

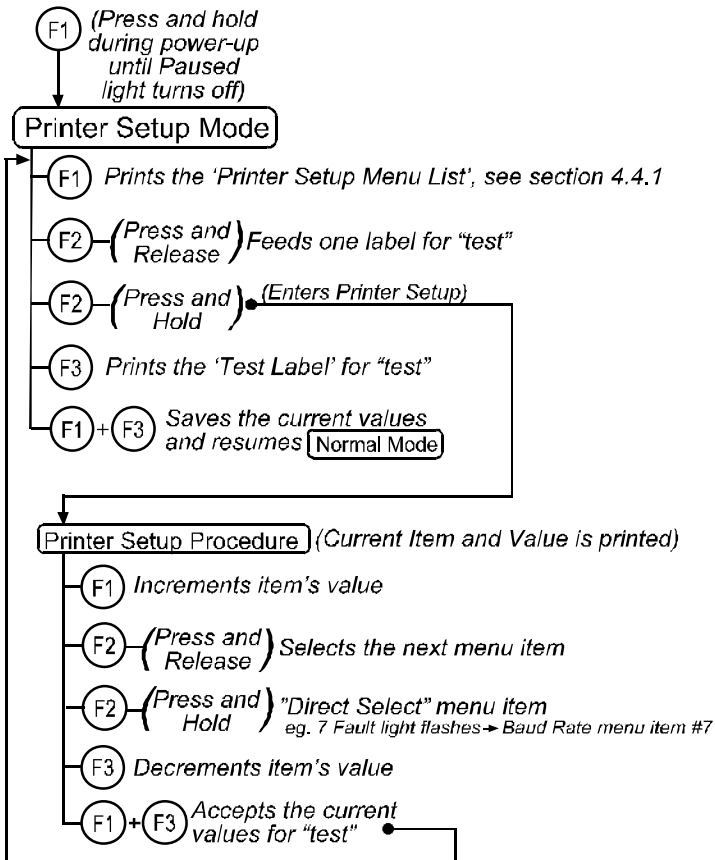
(F1)	+	(F2)	Prints the Test Label, see section 4.7.2.
(F1)	+	(F3)	Performs a warm reset and return to the Normal Mode of operation.
(F2)	+	(F3)	Will cause the printer to print the Database Configuration and Dot Pattern Labels.

4.4 Printer Setup Mode - Button Functions

In 'Printer Setup Mode' the printer's buttons control the setting of the printer's operating menu items such as Media Settings, Communications, and Options.

Note: It is recommend that the Printer Setup Mode is not executed with the printer in Peel Mode or the optional Present Sensor enabled. Depending on label size this can cause unpredictable results.

Note: If at any time you wish to discard your changes and revert back to the previous values simply turn off the printer.



Note: Printer and cutter faults are disabled during **Printer Setup Procedure**, but can still occur while printing "test" labels.

Note: Factory Defaults can be restored, see section 5.7

4.4.1 Printer Setup Menu List

The sample label below is the Printer Setup Menu List. This label shows all of the printer's current values for each menu item that can be modified using the front panel. The number far left of the Menu Item corresponds to its position in the Menu List, for selection by pressing **F2**.

For example to "Direct Select" the BAUD RATE Menu Item press and hold the **F2** button for 7 flashes of the FAULT light; for the TOF GAIN item hold **F2** for 12 flashes, etc.

		Values		
		↓		
1)	DIRECT		=	MEDIA TYPE
2)	EDGE		=	SENSOR TYPE
3)	NO		=	PRESENT SENSOR
4)	NO		=	CUTTER EQUIPPED
5)	127		=	SOP ADJUST, 0.005 in.
6)	127		=	PRESENT ADJUST, 0.005 in.
7)	9600		=	BAUD RATE, bps
8)	8		=	DATA BITS
9)	STD		=	CONTROL CODES
10)	100		=	CONT FORM LENGTH, 0.01 in.
11)	3		=	OOS MAXVOLT, 0.1 Volts
12)	12		=	TOF GAIN
13)	10		=	TOF DELTA, 0.1 Volts
14)	0		=	TOF LOW, 0.1 Volts
15)	416		=	LABEL WIDTH, 0.01 in.
16)	64		=	SCALABLE FONT, 4KB
17)	64		=	INTERNAL MODULE, 4KB
18)	NO		=	LABEL ALIGNMENT
19)	100		=	ALIGNMNET LENGTH, 0.01 in.
20)	HOST		=	STOP LOCATION
↑	Menu Item Numbers		↑	Menu Items

Note: When using narrow media the 'Menu Items' column will be truncated.

4.4.2 Menu Items and Values

The table below lists all the menu items and their possible values in the 'Printer Setup Procedure'.

<p>1) MEDIA TYPE</p> <p>Sets printing for either direct thermal (no ribbon) or thermal transfer (ribbon) stock.</p> <p><i>Possible Values:</i></p> <ul style="list-style-type: none"> * DIRECT THERMAL THERMAL TRANSFER 	<p>2) SENSOR TYPE</p> <p>Select the sensor type that matches your label stock.</p> <p><i>Possible Values:</i></p> <ul style="list-style-type: none"> * EDGE: (Gaps in media) (REFL) REFLECTIVE: (Black Mark) (CONT) CONTINUOUS: (No sensing)
<p>3) PRESENT SENSOR</p> <p>Enables/Disables the optional Present Sensor Assembly</p> <p><i>Possible Values:</i></p> <ul style="list-style-type: none"> * NO YES 	<p>4) CUTTER EQUIPPED</p> <p>Enables/Disables the optional Cutter Assembly</p> <p><i>Possible Values:</i></p> <ul style="list-style-type: none"> * NO YES
<p>5) SOP ADJUST</p> <p>This sets the point to begin printing, relative to the top-of-form (label's edge as detected by the media sensor).</p> <p><i>Possible Values:</i></p> <p>Range: 0 – 255; default = *128</p> <p>0 = close to edge</p> <p>255 = furthest from edge</p>	<p>6) PRESENT ADJUST</p> <p>This command specifies an additional amount to advance the label after print.</p> <p><i>Possible Values:</i></p> <p>Range: 0 – 255; default = *128</p> <p>0 = close to edge</p> <p>255 = furthest from edge</p>
<p>7) BAUD RATE</p> <p>Sets serial port baud rate to match host.</p> <p><i>Possible Values:</i></p> <p>600 to 38.4k; default = *9600</p>	<p>8) DATA BITS</p> <p>Set data word length to match host.</p> <p><i>Possible Values:</i></p> <ul style="list-style-type: none"> * 8 7

<p>9) CONTROL CODES</p> <p>Allows code selection listed in Programmer's manual.</p> <p><i>Possible Values:</i></p> <p>* (STD) STANDARD CODES (ALT) ALTERNATE CODES</p>	<p>10) CONT FORM LENGTH</p> <p>This command sets the page size (label length) when the printer's 'SENSOR TYPE' is set to continuous media.</p> <p><i>Possible Values:</i></p> <p>Range: 0 – 9999; default = *100 Units: .01 inch</p>
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<p>11) OOS MAXVOLT</p> <p>Sets the sensor reading that can indicate OOS, (out of stock condition).</p> <p><i>Possible Values:</i></p> <p>Range: 0 – 16; default = *2 Units: 0.1 volt</p>	<p>12) TOF GAIN</p> <p>Sets Top of Form (TOF) Gain value.</p> <p><i>Possible Values:</i></p> <p>Range: 0 – 15; default = *10</p>
--	---

<p>13) TOF DELTA</p> <p>Sets minimum change in the sensor reading required to recognize a "Gap" or Mark".</p> <p><i>Possible Values:</i></p> <p>Range: 0 – 50; default = *10 Units: 0.1 volt</p>	<p>14) TOF LOW</p> <p>Sets the minimum sensor reading for paper (EDGE) or mark (Reflective).</p> <p><i>Possible Values:</i></p> <p>Range: 0 – 50; default = *0 Units: 0.1 volt</p>
--	--

<p>15) LABEL WIDTH</p> <p>Sets the label width.</p> <p><i>Possible Values:</i></p> <p>Range: 75 – 410; default = *410 Units: .01 inch</p>	<p>16) Scalable Font</p> <p>Sets the number of 4K Byte blocks allocated for scaleable fonts.</p> <p><i>Possible Values:</i></p> <p>Range: 0 – 255; default = *64</p>
---	---

<p>17) INTERNAL MODULE</p> <p>Sets the number of 4K Byte blocks allocated for the internal RAM module.</p> <p>Possible Values:</p> <p>0 – 255; default = *128</p>	<p>18) LABEL ALIGNMENT <i>(see section 4.5 for more information)</i></p> <p>Sets Label Alignment Method.</p> <p>Possible Values:</p> <p>YES (printer uses 'ALIGNMENT LENGTH' or host sent value)</p> <p>AUTO (printer will automatically determine label length)</p> <p>* NO (Label Alignment disabled)</p>
---	---

<p>19) ALIGNMENT LENGTH <i>(see section 4.5 for more information)</i></p> <p>Leading edge to leading edge distance of two successive labels. Must be set when 'LABEL ALIGNMENT' is set to Yes.</p> <p>Possible Values:</p> <p>0 – 999; default = 100*</p> <p>Units: .01 inch</p>	<p>20) STOP LOCATION</p> <p>Sets convenient stop locations for different printer configurations.</p> <p>Possible Values:</p> <p>*HOST (printer uses host values of SOP and Present Distance)</p> <p>PEEL (sets stop location just behind the peel bar)</p> <p>CUT (sets stop location at the cutter blade)</p> <p>COVER (sets stop location at the tear plate)</p> <p>NONE (printer uses normal start location and ignores host commands)</p>
--	---

* = **Default Setting**

All of the menu items listed in the previous tables are stored in non-volatile memory.

4.4.3 Example of Changing Baud Rate

The following is a step by step example for modifying the Printer Setup. Although this example will show how to modify only the Baud Rate value from a default of 9600 bps to 19200 bps the same procedure can be used to change any of the printer's menu items.

Note: It is recommend that the Printer Setup Mode is not executed with the printer in Peel Mode or the optional Present Sensor enabled. Depending on label size this can cause unpredictable results.

1. With printer off and properly loaded with media press and hold the \odot button while powering up the printer. Continue to hold the button until the PAUSED light turns off then release.
2. Press and hold the F2 button and count 7 flashes of the FAULT light then release. The following printout should be showing:

```
7)  9600      BAUD RATE, bps
-----
```

3. Press the \odot button once to increment to the 19200 bps value. The following printout should be showing:

```
7)  19200     BAUD RATE, bps
7)  9600      BAUD RATE, bps
-----
```

4. At this point you will accept the current values for “test” and exit the Printer Setup Procedure by pressing the \odot + F3 buttons simultaneously.

Note: If you wish to discard your changes and revert back to the previous values simply turn off the printer before Step 5.

5. Now you can save your changes and resume **Normal Mode** by again pressing the \odot + F3 buttons simultaneously. Wait about 15 seconds for **Normal Mode** to begin.

Continued...

6. To confirm that your changes have been made press the (F2)+(F3) buttons simultaneously, this will print the Database Configuration Label. The label should show the new Baud Rate value of 19200.

FRI AUGUST 024, 2001 19:29 236 VER: ET4204 - 04.06 08/24/01 BOOT 83-2329-04A CODE 83-2325-04F FONT 83-2337-01A CPLD 592157-01C INTERNAL FLASH MODULE PRESENT SYSTEM RAM CHECKS GOOD SYSTEM RAM SIZE 2015 KBYTES SYSTEM RAM AVAIL 1244 KBYTES REG POWER SUPPLY YES		CONFIGURATION DIRECT THERMAL SERIAL PORT SELECTED 19.2; 8BITS ← EDGE CONT FORM LENGTH 0 PRESENT ADJUST 127 SOP ADJUST 127 TOF LOW 0 0 TOF DELTA 10 10 TOF GAIN 12 10 OOS MAXVOLT 3 3 LABEL ALIGNMENT NO ALIGN LENGTH 100 STOP LOCATION HOST
INPUT VALUES PAPER 255 DARKNESS 131 TRAN 255 REFL 149 RIBN 87 TEMP 48 VOLT 223	COUNTER INFORMATION ABSOLUTE VALUES 6-18-2001 LENGTH 773 INCHES TIME 20 HOURS RESETTABLE VALUES 6-22-2001 LENGTH 576 INCHES TIME 10 HOURS MEMORY CONFIGURATION INTERNAL MODULE 15 SCALABLE FONTS 32 LABEL SIZE 0416:02157 IN	

New '19.2'
Value

4.5 Label Alignment

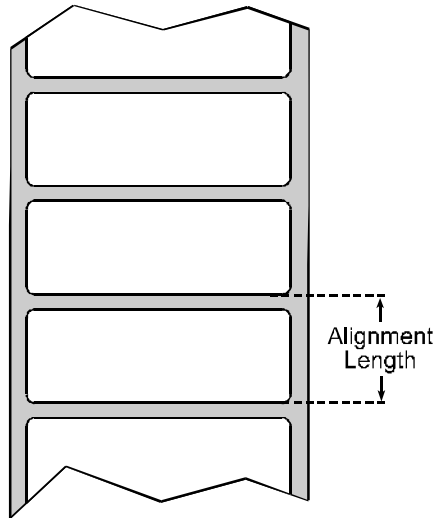
The Label Alignment function is intended for applications with short label lengths that result in wasted labels (*between the media sensor and printhead*) when printing the first label after changing media or at power-up. This is accomplished with providing the printer with a 'ALIGNMENT LENGTH' which can be manually measured and entered (*see section 4.5.1*) or automatically calculated using a Forced Alignment, (*see section 4.5.2*). Label Alignment, set via the menu system or via host commands, has three possible values: YES, AUTO, and NO which are covered in the following sections.

4.5.1 Label Alignment = YES

In this mode the operator must supply an 'ALIGNMENT LENGTH' value. The 'ALIGNMENT LENGTH' value is measured from label leading edge to label leading edge of two successive labels. This value can be sent via the host computer or entered by using the Menu Setup Mode.

The 'ALIGNMENT LENGTH' must be as accurate as possible. For very small labels, errors as small as 0.01" could result in noticeable print variations for the labels resting between the printhead and the media sensor.

If media of a different label length is loaded the 'ALIGNMENT LENGTH' must be recalculated and changed via the Menu Setup or host computer.



4.5.2 Label Alignment = AUTO

In this mode the printer can calculate the 'ALIGNMENT LENGTH' by performing a FORCED ALIGNMENT. This eliminates the need to physically measure the 'ALIGNMENT LENGTH' as in 4.5.1 *Label Alignment = YES*. This feature is usually preferred for applications requiring frequent changing of media of different label lengths.

To perform a FORCED ALIGNMENT press and hold the FEED button (approx. 4 seconds). The printer will measure and save the label length and then align the label. FORCED ALIGNMENT can result in wasted labels during the label measurement, (the larger the label length the more labels that are wasted), these labels are not rewound because of physical rewind limits that prevent ribbon and paper jamming.

FORCED ALIGNMENT with Present Sensor Enabled:

While the label length is measured the printer will pause, illuminating the PAUSE LED after each movement. The operator must press the Pause button for alignment to continue. This allows the operator to remove any labels as required. Labels should not be forcibly removed, as they may not actually be positioned for removal, but at an interim position required for length measurement.

4.5.3 Label Alignment = NO

When Label Alignment is not enabled (set to NO) printing begins at the current label position without alignment, assuming the label is at the start of print position. Additionally, for small label lengths, the labels between the printhead and the TOF sensor are wasted.

4.5.4 Label Alignment Recommended Settings

Label Alignment is intended for use with label length less than the distance between the printhead and the edge sensor, or where label wastage at power-up is a concern. Label Alignment is not recommended for label stock lengths greater than 6.5” or for label stock containing 2 or more form lengths.

Label Stock	Label Alignment Setting
Continuous	NO
6.5” or less	YES or AUTO
6.5” or more	NO
Multiple form length	NO

4.5.5 Label Alignment Troubleshooting

<u>Problem Description</u>	<u>Possible Cause</u>	<u>Solution</u>
Attempting to perform Label Alignment results in no paper movement.	With the Present Sensor enabled, Label Alignment can not be performed without a Label Length.	<ul style="list-style-type: none"> ➤ Set Label Alignment to AUTO, press and hold FEED till paper moves for automatic Label Alignment Length measurement. <li style="text-align: center;">~OR~ ➤ Re-measure Label Alignment Length, use Menu Setup to set new length, ensure desired length has been set.
First label wasted during alignment. All labels thereafter print with proper start of print position.	<p>Alignment Length is too long.</p> <p style="text-align: center;">~OR~</p> <p>For labels whose label length and stop position cause them to stop with a gap on the edge sensor, the alignment function can result in wasted labels.</p>	<ul style="list-style-type: none"> ➤ Set Label Alignment to AUTO, press and hold FEED till paper moves for automatic Label Alignment Length measurement. <li style="text-align: center;">~OR~ ➤ Re-measure Label Alignment Length, use Menu Setup to set new length, ensure desired length has been set. ➤ Obtaining a slightly different label Alignment Length measurement. Using label alignment AUTO mode, hold the FEED button to force an alignment and label measurement. Ensuring slack in the label stock may result in a slightly different measurement. The Alignment Length may also be set manually via the Setup Menu. Increasing or decreasing the value by 1 or 2 units (in./100) may help to prevent the wasted labels, however this may result in incorrect print positions for labels that are short in length.

<u>Problem Description</u>	<u>Possible Cause</u>	<u>Solution</u>
Label Alignment is incorrect. Pressing FEED successively results in a short label length, 1-inch.	Label Alignment Length is not correct. The default Label Alignment Length is 1.00”, and will result in this behavior when any larger label length is used without setting the appropriate length	<ul style="list-style-type: none"> ➤ Set Label Alignment to AUTO, press and hold FEED till paper moves for automatic Label Alignment Length measurement. <li style="text-align: center;">~OR~ ➤ Measure Label Alignment Length, use Menu Setup to set new length, ensure desired length has been set.
Label Alignment is incorrect. Pressing FEED successively results in a label length longer than actual, 1 inch.	Label Alignment Length is not correct. The default Label Alignment Length is 1.00”, and will result in this behavior when any larger label length is used without setting the appropriate length	<ul style="list-style-type: none"> ➤ Set Label Alignment to AUTO, press and hold FEED till paper moves for automatic Label Alignment Length measurement. <li style="text-align: center;">~OR~ ➤ Measure Label Alignment Length, use Menu Setup to set new length, ensure desired length has been set.

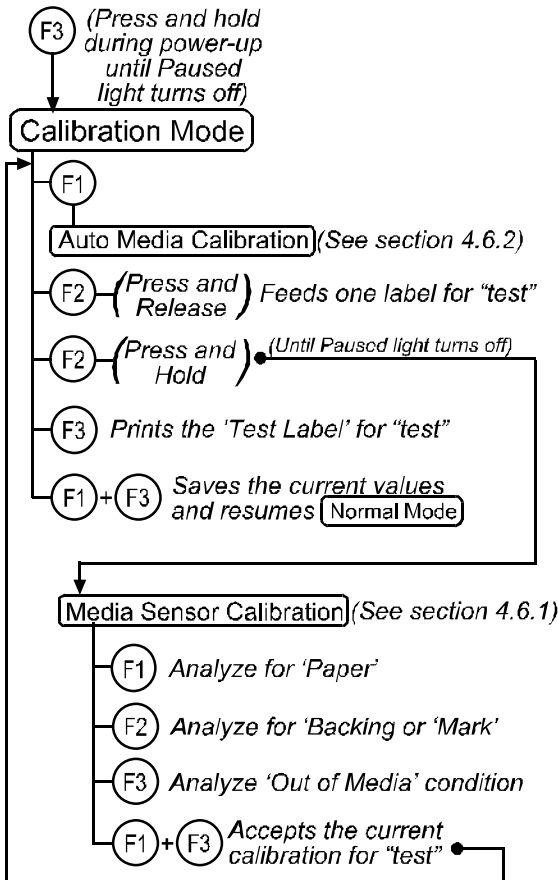
<u>Problem Description</u>	<u>Possible Cause</u>	<u>Solution</u>
Tear Mode selected but label stop position (present position) is not far enough forward.	Another present position has been determined. Enabling the Present Sensor causes the label stop position (present position) to be approximately 0.1” behind the peel bar. ~OR~ The Present Adjust value is not correct.	<ul style="list-style-type: none"> ➤ Disable the Present Sensor. <li style="text-align: center;">~OR~ ➤ Ensure the host computer is not providing a Present Distance shorter than is required for the Tear Bar. ➤ Use the Menu Setup to modify the Present Adjust value.
Tear Mode selected but label stop position (present position) is too far forward.	Another present position has been determined. ~OR~ The Present Adjust value is not correct.	<ul style="list-style-type: none"> ➤ Ensure the host computer is not providing a Present Distance longer than is required for the Tear Bar. ➤ Use the Menu Setup to modify the Present Adjust value.
FAULT LED illuminates during label alignment	The label supply is empty	<ul style="list-style-type: none"> ➤ Load new label stock

4.6 Calibration Mode

In 'Calibration Mode' the printer's buttons allows the printer to 'calibrate' the media for sensing of the Top of Form either automatically or manually.

Note: If at any time you wish to discard your changes and revert back to the previous calibration simply turn off the printer.

Note: Before calibrating, be sure the media sensor is set for the appropriate media type, see section 4.4.2, also be sure the printhead is latched down and the cover is closed.



Note: Printer and cutter faults are disabled during **Auto Media Calibration** and **Media Sensor Calibration**, but can still occur while printing "test" labels.

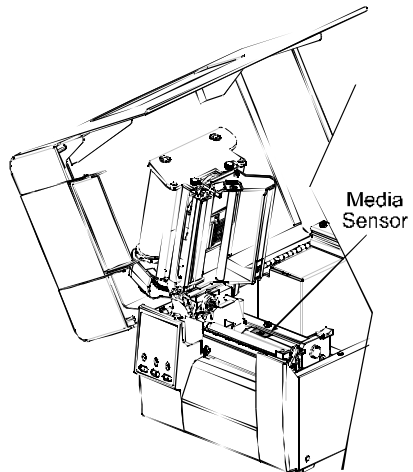
Note: Factory Defaults can be restored, see section 5.7

4.6.1 Media Sensor Calibration Procedure

The 'Media Sensor Calibration Procedure' allows the operator to recalibrate the selected media sensor (reflective or gap) for a selected media. Follow the steps below to calibrate your sensor.

Note: Before calibrating, be sure the media sensor is set for the appropriate media type, see section 4.4.2, also be sure the printhead is latched down and the cover is closed.

1. Hold the $(F3)$ button while powering up the printer, continue to hold the button until the PAUSED light turns off then release. Next press and hold the $(F2)$ button, continue to hold the button until the PAUSED light turns on then release.
2. Place a sample of your media (with backing) over the media sensor, close the printhead, and then press the $(F1)$ button. The printer will flash the FAULT light until it has finished analyzing the material.
3. Place a sample of your media backing or position the reflective mark of your continuous media over the media sensor, close the printhead, and then press the $(F2)$ button. The printer will flash the FAULT light until it has finished analyzing the material.
4. Remove all media from the media sensor, close the printhead, and then press the $(F3)$ button. The printer will flash the FAULT light until it has finished analyzing the media sensor for no media.
5. Once the calibration is complete (all three operations performed) press the $(F1)+(F3)$ buttons simultaneously to accept the current calibration for "test" and exit the **Media Sensor Calibration**.
6. Use the $(F2)$ button, (feeds blank label) and the $(F3)$ button, (prints test label) to test the current calibration.



Note: If you wish to discard your changes and revert back to the previous calibration simply turn off the printer before Step 7.

7. Now you can save your changes and resume **Normal Mode** by again pressing the $(F1)+(F3)$ buttons simultaneously.

4.6.2 Auto Media Calibration Procedure

The 'Auto Media Calibration Procedure' allows the operator to automatically obtain the optimum (TOF Low and TOF Delta) values for a particular media. These values are useful for media that continues to have troubles after Media Sensor has been manually calibrated (usually preprinted media). This operation feeds 10 inches of media using the current Media Sensor Calibration setting and calculates the TOF Delta and TOF Low values to be used. Upon completion the printer will exit back to 'Calibration Mode' flashing the PAUSED light if successful or the FAULT light if not successful.

Note: Before calibrating, be sure the media sensor is set for the appropriate media type, see section 4.4.2, also be sure the printhead is latched down and the cover is closed.

To perform the Auto Media Calibration complete the following steps:

1. Load the desired media.
2. Hold the $(F3)$ button while powering up the printer. Continue to hold the button until the PAUSED light turns off then release.
3. Next press the (-1) button, (the printer will now calibrate to the media)
4. The PAUSED light will flash 5 times to indicate a successful calibration. The FAULT light will flash 3 times to indicate an unsuccessful calibration.

Note: If you wish to discard your changes and revert back to the previous calibration simply turn off the printer before Step 5.

5. Now you can save your changes and resume Normal Mode by again pressing the $(-1)+(F3)$ buttons simultaneously.

4.7 Internal Labels

The following sections explain each of the printer's internally generated test and configuration labels.

4.7.1 Database Configuration and Dot Check Label

To print the Database Configuration and Dot Check Labels:

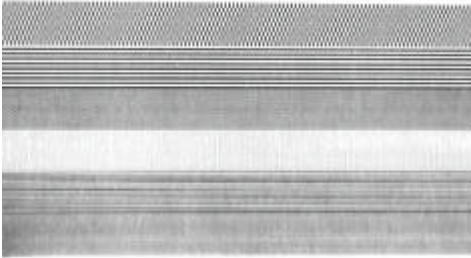
With the printer on, loaded with media (at least 4 inches wide), and ribbon (if printing in thermal-transfer). Press the $\text{F2}+\text{F3}$ buttons simultaneously to print the Database Configuration and Dot Check Label

Alternately, press and hold the F2 button and turning the printer on, continue holding the F2 button until the PAUSED light turns off. Using this method will initiate the 'Character Dump Mode'. Turn the printer off to terminate the 'Character Dump Mode'.

The first label printed will be the Database Configuration Label, which lists the printer's configuration and status.

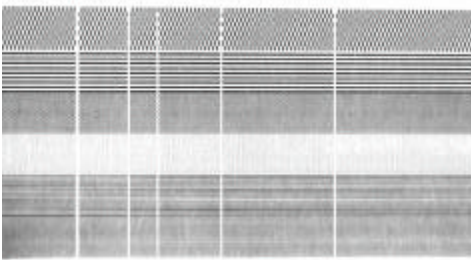
FRI AUGUST 024, 2001 19:29 236	CONFIGURATION
VER: ET4204 - 04.06 08/24/01	DIRECT THERMAL
BOOT 83-2329-04A	SERIAL PORT SELECTED
CODE 83-2325-04F	19. 2; 8BITS
FONT 83-2337-01A	EDGE
CPLD 592157-01C	CONT FORM LENGTH 0
INTERNAL FLASH MODULE PRESENT	PRESENT ADJUST 127
SYSTEM RAM CHECKS GOOD	SOP ADJUST 127
SYSTEM RAM SIZE 2015 KBYTES	TOF LOW 0 0
SYSTEM RAM AVAIL 1244 KBYTES	TOF DELTA 10 10
REG POWER SUPPLY YES	TOF GAIN 12 10
	OOS MAXVOLT 3 3
	LABEL ALIGNMENT NO
	ALIGN LENGTH 100
	STOP LOCATION HOST
INPUT VALUES	COUNTER INFORMATION
PAPER 255	ABSOLUTE VALUES 6-18-2001
DARKNESS 131	LENGTH 773 INCHES
TRAN 255	TIME 20 HOURS
REFL 149	RESETTABLE VALUES 6-22-2001
RIBN 87	LENGTH 576 INCHES
TEMP 48	TIME 10 HOURS
VOLT 223	
	MEMORY CONFIGURATION
	INTERNAL MODULE 15
	SCALABLE FONTS 32
	LABEL SIZE 0416:02157 IN

The second label printed is the Dot Check Label. This label is used to determine whether the printhead is in need of replacement. 'Good' and 'Faulty' Dot Check Labels are shown below:



Good Test Label:

Indicates that the printhead is operating normally.



Faulty Test Label:

Streaks in test label indicate a dirty or faulty printhead. (See Chapter 5 for cleaning and replacement.)

4.7.2 Test Label

This label is intended to be used to evaluate the current printer setup for print quality and label tracking and positioning.

To print the Test Label:

With the printer loaded with media (at least 4 inches wide), and ribbon (if printing in thermal-transfer), press the F1 + F2 buttons simultaneously to print the Internal Test Label.





Maintenance and Adjustments

5.0 Introduction

This chapter covers the cleaning, adjusting, and some troubleshooting tips involved with your printer. In addition, the following table provides a recommended cleaning schedule for the various parts of your printer.

Area	Method	Interval
Printhead	Turn off the printer before cleaning the printhead. Use solvent* on a cotton swab to clean the printhead from end to end.	After every roll of media.
Platen Roller	Turn the power off. Rotate the platen roller and clean it thoroughly with solvent* and a cotton swab.	After every roll of media.
Peel-Off Roller	Rotate the peel-off roller and clean it thoroughly with solvent* and a cotton swab.	After every roll of media.
Media Path	Solvent*	After every roll of media.
Peel/Tear Bar	Solvent*	As needed
Media Sensor	Air blow	Monthly
Exterior	Mild detergent or desktop cleaner.	As needed
Interior	Brush or vacuum cleaner	As needed.

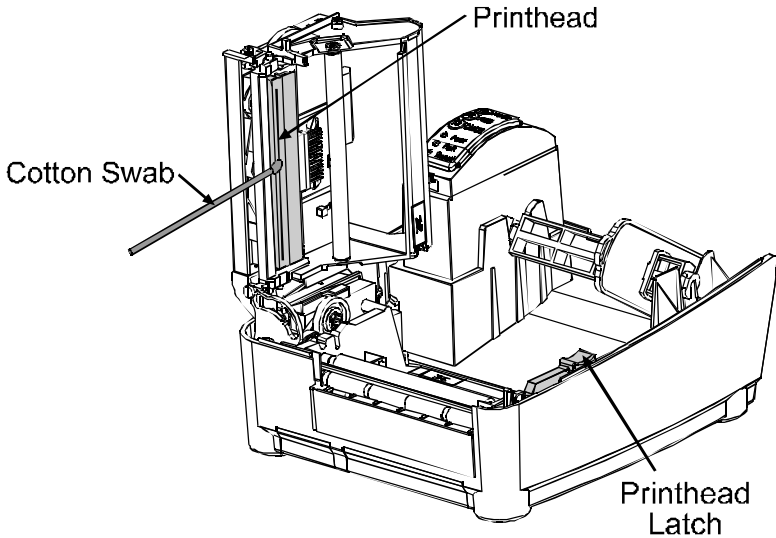
* Recommend using a solvent that contains isopropyl alcohol.

Warning: Isopropyl alcohol is a flammable solvent, always take the proper precautions when using this solvent.

5.1 Cleaning the Printhead

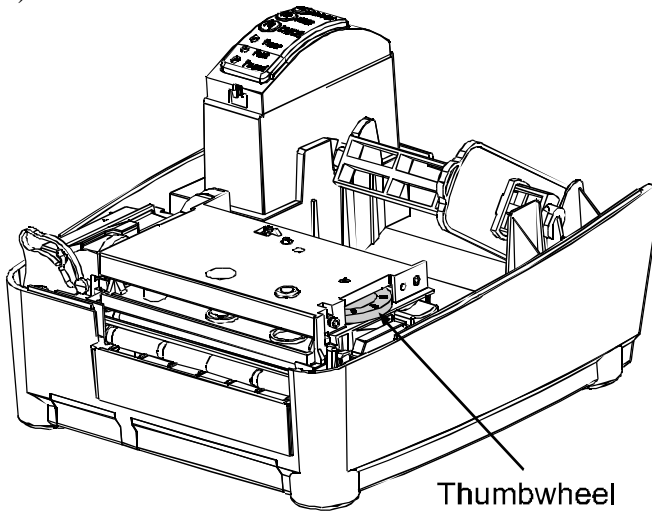
Warning: Turn 'off' the printer and unplug the unit from the outlet before cleaning the printhead.

1. Turn 'off' the printer and open the cover.
2. Push the Printhead Latch down and raise the Printhead Carrier Assembly.
3. Using a Cotton Swab dipped in isopropyl alcohol, rub the Cotton Swab along the Printhead.



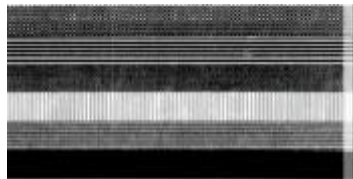
5.2 Media Width Adjustment

The thumbwheel on the side of the printhead carrier assembly allows the printhead to be adjusted for various sizes of media. The numbers on the thumbwheel serve only as a reference point and do not correspond with a particular media width. To adjust for narrow media move the Thumbwheel to the left (frontward), for wide media move it to the right (rearward).



1. Load media into the printer.
2. Print a label, if it is light on the right-hand side then move the Thumbwheel to the right (rearward), (see example below).

Light print on the right side of the test label indicates that the Thumbwheel should be adjusted to the right (rearward).

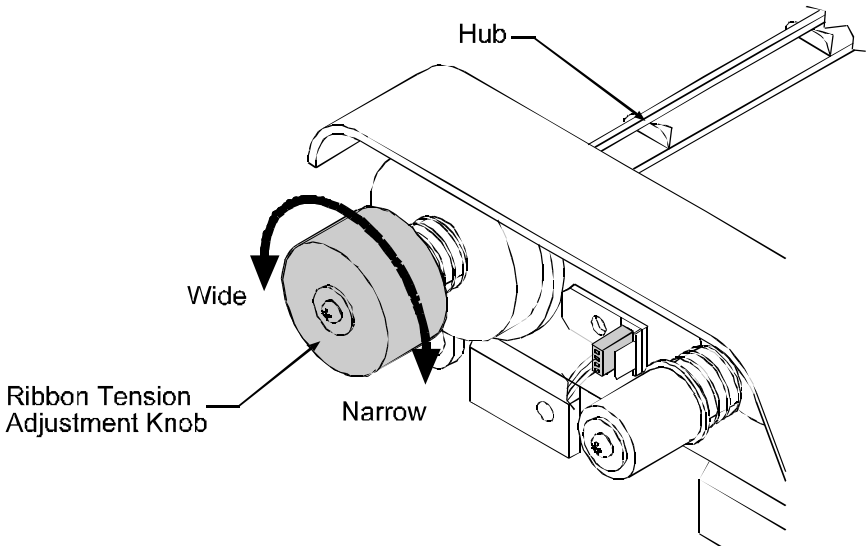


Note: If the media begins tracking to the right while printing the Thumbwheel should be adjusted to the left (forward)

5.3 Ribbon Width Adjustment

The adjustable ribbon handler feature allows adjustment to the ribbon supply hub that provides optimum tension when using different widths and/or types of media and ribbon.

1. Turn 'off' the printer.
2. Hold the Hub and rotate the Ribbon Tension Adjustment Knob to meet your media/ribbon widths based on the table below. Ensure that the Ribbon Tension Adjustment Knob is turned fully to the clockwise or counter-clockwise position, the knob will no longer turn once it is in the proper position, do not force or over turn.



Ribbon Size	Ribbon Width	Direction of Rotation
Narrow	1-2 inches wide	Clockwise*
Wide	2-4 inches wide	Counter-Clockwise*

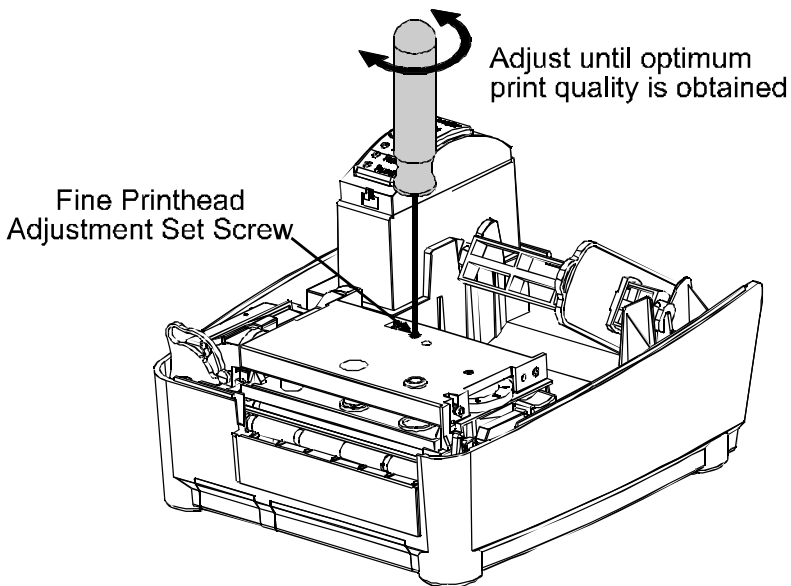
* Continue turning the ribbon tension adjustment knob until it will not turn any further in either the clockwise or counter-clockwise position.

5.4 Fine Printhead Adjustment

A fine printhead adjustment set screw is located on top of the printhead carrier assembly that can be used for adjusting print quality. This adjustment is set at the factory and should not need further adjusting; however, with different types and thickness of media some adjustment may be necessary.

To adjust the printhead, turn the Set Screw until optimum print quality is obtained, (some trial and error may be necessary). Do not over tighten the Set Screw.

Note: It is not necessary to remove the Ribbon Handler Assembly, (if equipped). An access hole in the assembly is provided for adjustments.



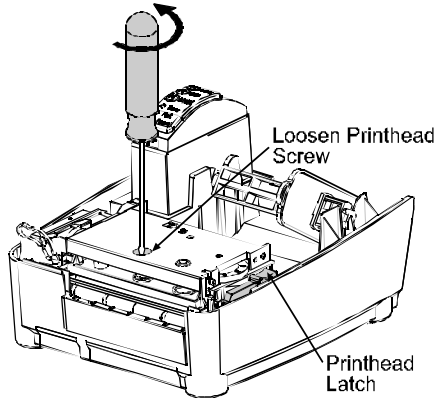
5.5 Printhead Replacement

Removal:

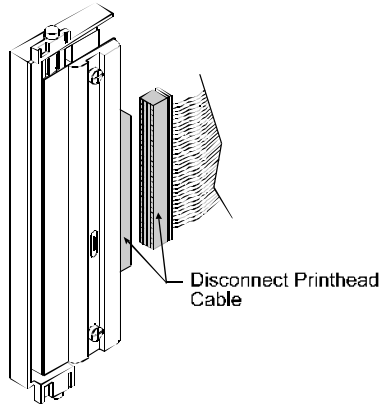
Note: It is not necessary to remove the Ribbon Handler Assembly, (if equipped). An access hole in the assembly is provided for access.

Note: Always follow proper ESD (Electro Static Discharge) procedures when replacing the printhead.

1. Turn off the printer.
2. Loosen the Printhead Screw until it is free from the printhead. Carefully unlatch the printhead carrier assembly and remove the printhead.



3. Remove the printhead cables from the back of the printhead.



Replacement:

1. Connect the printhead cable to the new printhead.
2. Position the printhead on the printhead carrier assembly and tighten the printhead screw.
3. Ensure that the printhead cable is not pinched and that the Printhead is clean.

5.6 Darkness Adjustment

The Darkness Adjustment (located on the rear of the printer), allows the operator to adjust the 'print darkness' on the printed ticket. Turning the Darkness Adjustment clockwise will make the print darker, turning it counterclockwise will lighten the print.

Note: Large increases the 'Darkness Adjustment' can shorten printhead life. If you need to increase the 'Darkness' level large amounts, try instead increasing the Heat value and/or slowing the Print Speed through your software or DPL commands first.

5.7 Resetting to the Factory Defaults

With the printer off, press and hold the F1, F2, and F3 buttons while turning the printer on. Continue to hold the buttons down until the PAUSED light turns off. The printer will now be set to the 'Factory Defaults'. See Section 4.4.1 for a listing of the factory defaults.

5.8 Downloading Firmware and Fonts

The printer stores its Boot Loader, Operating Program, and Font in Flash memory on the main PCB. This configuration allows updates and/or new features to the printer.

1. Identify the desired firmware revision from the Datamax FTP site at <ftp://ftp.datamaxcorp.com> and download the desired version on to your computer's hard drive or a floppy disk.
2. With the printer's power turned 'on', the printer is now ready to accept the new firmware data. Using the DOS copy command enter:

```
copy filename.dlf lpt1/b
```

<p><input checked="" type="checkbox"/> Note: Other programs (such as hyper-terminal and certain Windows® Driver programs) may also be used to download this file.</p>
--

The Paused Indicator blinks during the download. After a successful download, the printer will illuminate the Paused Indicator steady. The printer will write to Flash memory after all data is received, and the checksum and other data are validated. The printer will then perform a 'cold reset' and print a Configuration Label to verify the new firmware version.

If the download was unsuccessful, the 'Fault' Indicator will illuminate and the printer will 'warm reset'. The previous firmware programming will not be affected, unless substantial firmware data structure changes have occurred. If the printer fails to warm reset, it may be necessary to toggle power 'off' and 'on', or simultaneously press and release PAUSE and CANCEL Buttons.

If the download fails, try re-sending the file. If it continues to fail, the following are possible causes:

- An invalid or corrupted file is being downloaded. Make sure the file you are attempting to download is correct and applicable for your printer model.
- Possible communications errors are occurring. Check the cable connections between the host computer and the printer. Be sure to use a quality-shielded cable.
- The printer could not successfully write to or erase the Flash memory; it may be defective. Try again and if problem persists, call for service.



Troubleshooting

6.0 Introduction

Occasionally situations occur that requires some troubleshooting skills. Possible problem situations and potential solutions are listed in this section. While not every situation is addressed, you may find some of these tips helpful. After the correction action is taken press the feed button to clear the alarm. Contact a qualified service technician for problems that persist or are not covered in this section.

Problem Situation	Page
Unacceptable print quality	46
The Printer does not print or prints several labels at once	46
The ribbon does not advance	46
Skips every other label	47
Unable to print in rotation 4	47
Prints light on the right side of the label	47
Printer fails to turn on	47
Label advances 1-2 inches before a fault indication	48
Label advances 16 inches before a fault indication	48
Tracking Problems	48

Unacceptable print quality:

- Dirty printhead. Clean the printhead, (see Chapter 5).
- The printhead temperature is too high. Use the software control to adjust the Heat Setting, Print Speed, or adjust the darkness adjustment located on the back of the printer.
- The incorrect ribbon/paper combination is being used, check the ribbon type being used.
- Faulty Printhead, replace, (see Chapter 5) or call for service.

The Printer does not print or prints several labels at once:

- The labels are incorrectly loaded, see the loading instructions on the inside cover of the printer, or Chapter 3.
- The media is not calibrated, (see Chapter 4)
- The media sensor or media sensor circuitry may be defective, call for service.

The ribbon does not advance

(The printer advances paper but ribbon does not advance).

- The ribbon is installed incorrectly. Open the printhead and make sure that the ink side faces the paper. With most ribbon this can be verified by rubbing paper against the ribbon, the ink should smudge the paper. With label stock use the sticky side of a label, the ink will stick to the label.
- A bad ribbon/paper combination is resulting in an insufficient amount of friction between paper and ribbon. Ensure that the correct type of ribbon is being used.

Skips every other label

(Print quality is good but skips every other label).

- The label is formatted too close to the top edge of the form. Leave white space equal to 8-dot rows at the top of the label, approximately .02" (.5mm).
- The media is not calibrated, (see Chapter 4)
- The media sensor or media sensor circuitry may be defective, call for service.

Unable to print in rotation 4

- The characters are formatted outside the dimensions of the label. Check that the row/column values provide enough room for the height of the characters or bar code to be printed.

Prints light on the right side of the label

- The media width adjustment thumbwheel is set for a narrower media width than the actual media being used, (see Chapter 5).
- The printhead is not properly aligned, call for service.
- The printhead is not locked down.

Printer fails to turn on

- A fuse may be blown, call for service.
- Faulty AC cord, replace
- A bad power switch may exist on the printer, call for service.
- A faulty AC wall outlet.

Label advances 1-2 inches before a fault indication

- The ribbon is installed incorrectly. Make sure that the dull side (side with ink) is facing the paper.
- A bad ribbon/paper combination is resulting in an insufficient amount of friction between paper and ribbon. Ensure that the correct type of ribbon is being used.

Label advances 16 inches before a fault indication

- The media is not loaded properly, see Chapter 5. When loading media be certain that the media hub and media guide is against the media and that gaps or marks in the labels are in line with the media sensor.
- The media sensor or media sensor circuitry may be defective, call for service.

Tracking Problems

- The media is not loaded properly, see Chapter 5. When loading media be certain that the media hub and media guide is against the media.
- The media width adjustment thumbwheel is not set properly, (see Chapter 5).



Specifications

7.0 Printer Specifications

Mechanical

Width	8.5" (21.6 cm)
Depth	9.5" (24.1 cm)
Height	6.25" (15.9 cm)
Weight	4 lbs. (1.8 kg)
Operating Temperature	40° F to 95° F (4° C to 35° C)
AC INPUT POWER	110V Standard (Non Auto-Ranging) (50-2024-01); 105 to 125, 60 Hz 220V Standard (Non Auto-Ranging) (50-2034-01); 210 to 250, 50 Hz Standard (Auto-Ranging) (50-2050-01); 100 to 240, 50-60 Hz Heavy Duty (Auto-Ranging) (50-2049-01); 105 to 250, 50-60 Hz

Printer Specifications

Print Type	Direct Thermal
Print Speed	<i>E-4203:</i> 1-4 IPS (25.4-101.6 mm/s); <i>4IPS requires optional power supply.</i> <i>E-4204&E-4304:</i> 1-4 IPS (25.4-101.6 mm/s)
Resolution	<i>E-4203&E-4204:</i> 203 dpi (8 dots/mm) <i>E-4304:</i> 300 dpi (11.8 dots/mm)
Tear Bar	Tear up
DRAM Memory	2MB

FLASH Memory

1MB

Media/Ribbon

Media Types	Roll-Fed, Die-Cut, Continuous, Fan-Fold
Max. Media Width	4.3" (109.2 mm)
Min. Media Width	1" (25.4 mm)
Max. Print Width	4.09" (104 mm)
Print Length Range	.375-24" (9.52-609.6 mm)
Media Thickness Range	.0025-.01" (.064 mm - .254 mm); <i>up to .007" (.117 mm) with optional cutter</i>
Supply Roll Capacity	<i>E-4203:</i> 4" (101.6 mm) O.D. on 1" (25.4 mm) core <i>E-4204&E-4304:</i> 5" (127.0 mm) O.D. on 1" (25.4 mm) core
Ribbon Width Range	1.0-4.3" (25-110 mm)
Optional Ribbon	Matched to media; approx. 361' (110m) long 1.5" O.D. on .5" core

Communications

Interface	RS-232 (DB-9), and Centronics Parallel
Baud Speed	600 to 38,400 bps
Handshaking	Xon/Xoff, CTS, DTR
Parity	Even, Odd, or None
Stop Bits	1 or 2
Data Bits	7 or 8

Fonts

9 Bit Map fonts
Rotated 0, 90, 180, 270 degrees

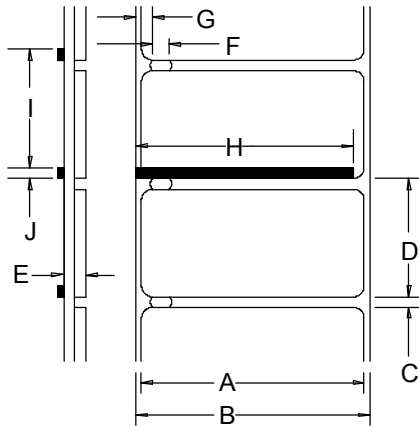
Imbedded Bar Codes

Code 39, Interleaved 2 of 5, Code 128 A, B & C, Codabar, LOGMARS, UPC-A, UPC-E, UPC 2&5, EAN-8, EAN-13, EAN 2&5, UPC Random Weight, Code 93, Plessey, USCS, Code 128 MOD 43, Postnet, Uss/EAN-128 Random Weight, Telepen, UPS Maxicode, PDF417, and Datamatrix

Approved Media

To achieve optimum print quality and maximum printhead life, Datamax recommends the use of **DATAMAX®** brand media and ribbons. These supplies are specially formulated for use in our printers; use of non-Datamax supplies may affect the print quality, performance, and life of the printer or its components.

For a current list of approved media and ribbons for use in direct thermal and thermal-transfer applications, please contact a Media Representative at (407) 523-5650.



Designator	Description	Maximum*	Minimum*
A	Label width	4.09	1.00
B	Backing width	4.30	1.00
C	Gap between labels	.25	.10
D	Label length	24***	.375****
E	Total thickness	.010	.0025
F	Notch opening width	.50	.20
G	Distance from the edge of the media to the media sensor aperture (left justified)	.175	.125
H	Reflective mark width**	4.10	.50
I	Distance between reflective marks	24***	.375****
J	Reflective mark length	.25	.10

* Units of measure are in inches.

** The reflective (black) mark must be carbon based, placed on the backside of the stock, and the reflectance shall be less than 10% at wavelengths of 950 and 640 nm.

*** The label length may vary up to 99 inches with printable area not exceeding the maximum label length.

**** This distance is inclusive of the minimum gap between labels.

***** This distance is inclusive of the minimum reflective mark.



Appendix A

ASCII Control Code Chart

	Char	Dec	Hex	Char	Dec	Hex	Char	Dec	Hex	Char	Dec	Hex
Ctrl @	NUL	0	00		32	20	@	64	40	`	96	60
Ctrl A	SOH	1	01	!	33	21	A	65	41	a	97	61
Ctrl B	STX	2	02	“	34	22	B	66	42	b	98	62
Ctrl C	EXT	3	03	#	35	23	C	67	43	c	99	63
Ctrl D	EOT	4	04	\$	36	24	D	68	44	d	100	64
Ctrl E	ENQ	5	05	%	37	25	E	69	45	e	101	65
Ctrl F	ACK	6	06	&	38	26	F	70	46	f	102	66
Ctrl G	BEL	7	07	'	39	27	G	71	47	g	103	67
Ctrl H	BS	8	08	(	40	28	H	72	48	h	104	68
Ctrl I	HT	9	09	)	41	29	I	73	49	i	105	69
Ctrl J	LF	10	0A	*	42	2A	J	74	4A	j	106	6A
Ctrl K	VT	11	0B	+	43	2B	K	75	4B	k	107	6B
Ctrl L	FF	12	0C	,	44	2C	L	76	4C	l	108	6C
Ctrl M	CR	13	0D	-	45	2D	M	77	4D	m	109	6D
Ctrl N	SO	14	0E	.	46	2E	N	78	4E	n	110	6E
Ctrl O	SI	15	0F	/	47	2F	O	79	4F	o	111	6F
Ctrl P	DLE	16	10	0	48	30	P	80	50	p	112	70
Ctrl Q	DC1	17	11	1	49	31	Q	81	51	q	113	71
Ctrl R	DC2	18	12	2	50	32	R	82	52	r	114	72
Ctrl S	DC3	19	13	3	51	33	S	83	53	s	115	73
Ctrl T	DC4	20	14	4	52	34	T	84	54	t	116	74
Ctrl U	NAK	21	15	5	53	35	U	85	55	u	117	75
Ctrl V	SYN	22	16	6	54	36	V	86	56	v	118	76
Ctrl W	ETB	23	17	7	55	37	W	87	57	w	119	77
Ctrl X	CAN	24	18	8	56	38	X	88	58	x	120	78
Ctrl Y	EM	25	19	9	57	39	Y	89	59	y	121	79
Ctrl Z	SUB	26	1A	:	58	3A	Z	90	5A	z	122	7A
Ctrl [	Esc	27	1B	;	59	3B	[	91	5B	{	123	7B
Ctrl \	FS	28	1C	<	60	3C	\	92	5C	|	124	7C
Ctrl]	GS	29	1D	=	61	3D	]	93	5D	}	125	7D
Ctrl ^	RS	30	1E	>	62	3E	^	94	5E	~	126	7E
Ctrl _	US	31	1F	?	63	3F	_	95	5F		127	7F

Char	Dec	Hex	Char	Dec	Hex	Char	Dec	Hex	Char	Dec	Hex
Ç	128	80	á	160	A0		192	C0	Ó	224	E0
ü	129	81	í	161	A1		193	C1	ß	225	E1
é	130	82	ó	162	A2		194	C2	Ô	226	E2
â	131	83	ú	163	A3		195	C3	Ö	227	E3
ä	132	84	ñ	164	A4		196	C4	ø	228	E4
à	133	85	Ñ	165	A5		197	C5	Õ	229	E5
å	134	86	ª	166	A6	ã	198	C6	µ	230	E6
ç	135	87	º	167	A7	Ã	199	C7	¶	231	E7
ê	136	88	¿	168	A8		200	C8	·	232	E8
è	137	89	®	169	A9		201	C9	Û	233	E9
ë	138	8A		170	AA		202	CA	Ü	234	EA
ï	139	8B	1/2	171	AB		203	CB	Û	235	EB
î	140	8C	1/4	172	AC		204	CC	ý	236	EC
ì	141	8D	¡	173	AD		205	CD	ÿ	237	ED
ÿ	142	8E		174	AE		206	CE		238	EE
À	143	8F	–	175	AF		207	CF		239	EF
É	144	90		176	B0	Ò	208	D0		240	F0
Æ	145	91		177	B1	Ɔ	209	D1	±	241	F1
Æ	146	92	²	178	B2	Ê	210	D2		242	F2
ô	147	93	³	179	B3	Ë	211	D3	3/4	243	F3
ö	148	94	´	180	B4	È	212	D4		244	F4
ò	149	95	Á	181	B5		213	D5		245	F5
û	150	96	Â	182	B6	Í	214	D6	÷	246	F6
ù	151	97	À	183	B7	Î	215	D7	¸	247	F7
ÿ	152	98	©	184	B8	Ï	216	D8	°	248	F8
Ö	153	99	¹	185	B9		217	D9	¨	249	F9
Ü	154	9A		186	BA		218	DA	·	250	FA
Ø	155	9B	»	187	BB		219	DB		251	FB
£	156	9C		188	BC		220	DC		252	FC
Ø	157	9D	¢	189	BD		221	DD		253	FD
x	158	9E	¥	190	BE	ì	222	DE		254	FE
f	159	9F		191	BF		223	DF	€	255	FF

Notes: For the hardware handshake XON/XOFF commands:

XON = Ctrl Q (DC1)

XOFF = Ctrl S (DC3)

The Euro € character has been added to the table above at 255 (FF) as a Datamax standard for resident bit-mapped fonts 0,1,2,3,4,5,6, and 9 (CG Triumvirate).



Appendix B

Embedded Fonts and Barcodes

All character fonts and barcodes available with the printer are described in this section. Each font and barcode has a name associated with it for use in programming. Human-readable fonts have numeric names while barcode fonts have alpha names.

Fonts

Fonts 0 through 8 use the slash zero (Ø) conventions for distinguishing between the zero and the alphabetic O. The slash can be removed with the label-formatting command Z. These fonts are non-proportional (monospaced); all of the characters take up the same amount of space when printed.

The Triumvirate font number 9 is a proportional font; each character will take up a different amount of space when printed.

Font	Valid ASCII Characters (decimal)	Use with Record Structure Type
0	32-127,255	Internal Bit-Mapped Fonts
1	32-168, 171, 172, 225,255	
2	32-168, 171, 172, 225,255	
3	32, 35-38, 40-58, 65-90, 128, 142-144, 146, 153, 154, 156, 157, 165, 168, 225,255	
4	32, 35-38, 40-58, 65-90, 128, 142-144, 146, 153, 154, 156, 157, 165, 168, 225,255	
5	32, 35-38, 40-58, 65-90, 128, 142-144, 146, 153, 154, 156, 157, 165, 168, 225,255	
6	32, 35-38, 40-58, 65-90, 128, 142-144, 146, 153, 154, 156, 157, 165, 168, 225,255	
7	32-126	
8	32, 48-57, 60, 62, 67, 69, 78, 83, 84, 88, 90	
9	32-126, 128-169, 171-173, 181-184, 189, 190, 198, 199, 208-216, 222, 224-237, 241, 243, 246-250,255	Smooth Font
9	Dependent upon selected symbol set; see Appendix H in the Programmers Manual.	Downloadable Scalable Font

The table below lists the font sizes. The numbers indicate the number of dots.

FONT	HEIGHT	WIDTH	SPACING
Font 0	7	5	1
Font 1	13	7	2
Font 2	18	10	2
Font 3	27	14	2
Font 4	36	18	3
Font 5	52	18	3
Font 6	64	32	4
Font 7	32	15	5
Font 8	28	15	5

Font 0 96-character alphanumeric, upper and lower case.

```
Font 0
!"#$%&'()*+,-./
0123456789:;<=>?@
ABCDEFGHIJKLMNQP
QRSTUVWXYZ[\]^_`
abcdefghijklmnopqrstuvwxyz
!@#%&'()*+,-./0123456789:;<=>?@
```

Font 1 145-character upper and lower case alphanumeric w/ descenders and ascenders.

```
Font 1:
!"#$%&'()*+,-./0123456789:;<=>?@
ABCDEFGHIJKLMNQPQRSTUVWXYZ[\]^_`
abcdefghijklmnopqrstuvwxyz{|}~
ÇüéàáâãäåæçèéëìíîËÄËøŒóö
ûüÿ0ÙøŁ0×fa iouñN@øŁ¼½¾
```

Font 2 138-character alphanumeric, upper and lower case.

```
Font 2:
!"#$%&'()*+,-./0123456789:;<=>?@
ABCDEFGHIJKLMNQPQRSTUVWXYZ[\]^_`
abcdefghijklmnopqrstuvwxyz{|}~
ÇüéàáâãäåæçèéëìíîËÄËøŒóö
ûüÿ0ÙøŁ0×fa iouñN@øŁ¼½¾
```

Font 3 62-character alphanumeric, uppercase.

```
FONT 3:
!"#$%&'()*+,-./0123456789:
ABCDEFGHIJKLMNQPQRSTUVWXYZ
ÇAÉÖÜ:ŁŒŒ¼½¾
```

Font 4 62-character
alphanumeric, uppercase.

FONT 4:
\$ % & () * + . - . / 0 1 2 3 4 5 6 7 8 9 :
A B C D E F G H I J K L M N O P Q R S T U V W X Y Z
Ç Ä Å É Ö Ù £ Ø Ñ Ì Ò

Font 5 62-character
alphanumeric, uppercase.

FONT 5:
\$ % & () * + . - . / 0 1 2 3 4 5 6 7 8 9 :
A B C D E F G H I J K L M N O P Q R S T U V W X Y Z
Ç Ä Å É Ö Ù £ Ø Ñ Ì Ò

Font 6 62-character alphanumeric, uppercase.

FONT 6:
\$ % & () * + . - . /
0 1 2 3 4 5 6 7 8 9 :
A B C D E F G H I J K L
M N O P Q R S T U V W X Y Z
Ç Ä Å É Ö Ù £ Ø Ñ Ì Ò

Font 7 OCR-A, size I.

Font 8 OCR-B, size III.

Font 7:

! " # \$ % & ' () * + , - . /
0 1 2 3 4 5 6 7 8 9 : ; < = > ? @
A B C D E F G H I J K L M N O
P Q R S T U V W X Y Z [\] ^ _ `
a b c d e f g h i j k l m n o
p q r s t u v w x y z { | } ~ ¯

Font 8:

0123456789
<>CENSTXZ|

Font 9 Internal Triumvirate font.

Point sizes are selected by the number in the barcode height.

Larger point sizes can be obtained by increasing the height and width multipliers, 48pt and 72pt fonts are generated by doubling the 24pt and 36pt fonts respectively (see the *Programmer's Manual* for more information).

6 pt ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstuvwxyz0123456789
8 pt ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstuvwxyz
10 pt ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstuvwxyz
12 pt ABCDEFGHIJKLMNOPQRSTUVWXYZabc
14 pt ABCDEFGHIJKLMNOPQRSTUVWXYZ
18 pt ABCDEFGHIJKLMNOPQR
24 pt ABCDEFGHIJKLM
30 pt ABCDEFGHIJ
36 pt ABCDEFG
48 pt ABCD

Barcodes

Bar Code fonts have alpha names (left column in the table below). Uppercase alpha names will print barcodes with human-readable interpretations. Lowercase alpha names will print barcodes only. The table is followed by visual samples.

Bar Code ID	Type	Length	Check-sum	Valid ASCII Characters, decimal value representation
A / a	Code 3 of 9	Varies	No	32, 36, 37, 42, 43, 45-57, 65-90
B / b	UPC-A	11	Yes	48-57 Numeric only Option V used in the 6th & 7th position
C / c	UPC-E	6	Yes	48-57 Numeric only
D / d	Interleaved 2 of 5 (I 2 of 5)	Varies	No	48-57 Numeric only
E / e	Code 128	Varies	M-103	32-127
F / f	EAN-13	12	Yes	48-57 Numeric only. Option V used in the 7th & 8th position
G / g	EAN-8	7	Yes	48-57 Numeric only
H / h	Health Industry Bar Code	Varies	M-43	32, 36-39, 42, 43, 45-57, 65-90
I / i	Codabar	Varies	No	36, 43, 45-58, 65-68
J / j	I 2 of 5 with modulo 10 checksum	Varies	M-10	48-57 Numeric only
K / k	Plessey	Up to 14	M-10	48-57 Numeric only. Option + is Last Character for Second M-11 Checksum
L / l	I 2 of 5 with modulo 10 checksum & bearer bars	13	M-10	48-57 Numeric only
M / m	2 digit UPC addendum	2	Yes	48-57 Numeric only
N / n	5 digit UPC addendum	5	Yes	48-57 Numeric only
O / o	Code 93	Varies	No	35-38, 42-58, 65-90, 97-122
p	Postnet	Varies	Yes	48-57 Numeric only
Q / q	UCC/EAN Code 128	19	Yes	48-57 Numeric only
R / r	UCC/EAN Code 128 K-Mart NON EDI bar code	18	Yes	48-57 Numeric only
S / s	UCC/EAN Code 128 Random Weight	34 +	Yes	48-57 Numeric only
T / t	Telepen	Varies	Yes	Alphanumeric
U	UPS MaxiCode	84	Yes	Alphanumeric

Bar Code ID	Type	Length	Check-sum	Valid ASCII Characters, decimal value representation
u	UPS MaxiCode with Byte Count	Specified	Yes	Alphanumeric
v	FIM	1	No	A, B, C, D
z	PDF417	Varies	Yes	All
Z	PDF417 with Byte Count	Specified	Yes	All
W1c	DataMatrix	Varies	Yes	All 8-bit values
W1C	DataMatrix with Byte Count	Specified	Yes	All 8-bit values
W1d	QR Code – Auto format	Varies	Yes	Alphanumeric
W1D	QR Code – Manual format	Varies	Yes	Single-byte or Kanji double-byte
W1f	Aztec	Varies	Yes	All 8-bit values
W1F	Aztec with Byte Count	Specified	Yes	All 8-bit values
W1T	TCIF Linked Barcode 3 of 9 (TLC39)	Varies	No	Alphanumeric
W1z	MicroPDF417	Varies	Yes	All 8-bit values
W1Z	MicroPDF417 with Byte Count	Specified	Yes	All 8-bit values

Barcode A Code 3 of 9



Barcode B UPC-A



Barcode C UPC-E



Barcode D Interleaved 2 of 5



Barcode E Code 128



Barcode F EAN-13



Barcode G EAN-8



Barcode H Health Industry
Barcode (HIBC)



Barcode I Codabar



Barcode J Interleaved 2 of 5
w/module 10 checksum



Barcode K Plessey



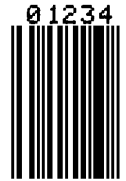
Barcode L Interleaved 2 of 5
w/module 10 checksum and
shipping bearer bars



Barcode M 2 Digit UPC
addendum



Barcode N 5 Digit UPC
addendum



Barcode O Code 93



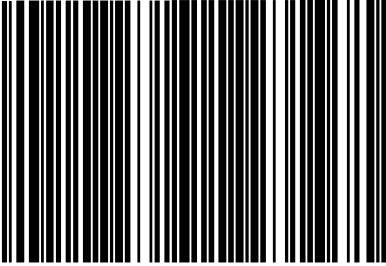
Barcode p Postnet



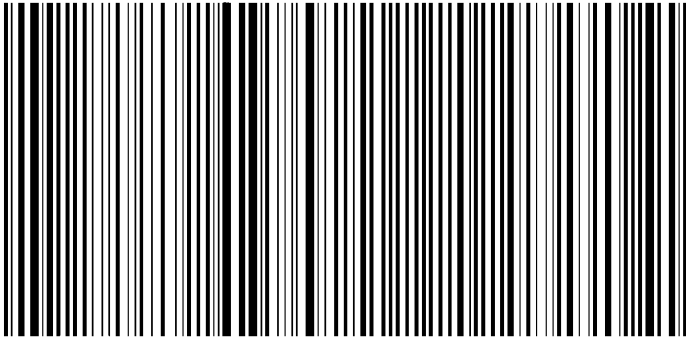
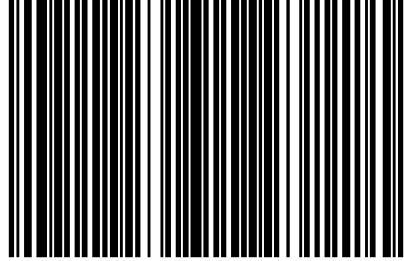
Barcode Q UCC/EAN Code 128

Barcode R UCC/EAN Code 128
KMART NON EDI

(01) 2 3456789 012345678 9

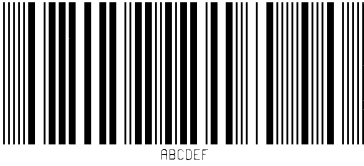


34 567890 123 4567

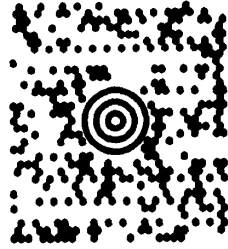


01 10073675029260 11 930420 3202 001800 21 10123456

Barcode S UCC/EAN Code 128 Random Weight



Barcode T Telepen



Barcode u UPS MaxiCode



Barcode v FIM



Barcode z PDF 417



Bar Code W1c: DataMatrix



Bar Code W1d: QR Code



Bar Code W1f: Aztec



Bar Code W1z: MicroPDF417



Bar Code W1T: TCIF Linked Barcode 3 of 9 (TLC39)



Appendix C

Datamax Barcode Products Limited Warranty Statement

E-Classä 4203/4204/4304 Printer

Printer

Datamax warrants to Purchaser that under normal use and service, the E-Class™ 4203/4204/4304 Printer, (with the exception of the thermal printhead) purchased hereunder shall be free from defects in material and workmanship for a period of (365) days from the date of shipment by Datamax.

Expendable and/or consumable items or parts such as lamps, fuses, labels and ribbons are not covered under this warranty. This warranty does not cover equipment or parts which have been misused, altered, neglected, handled carelessly, or used for purposes other than those for which they were manufactured. This warranty also does not cover loss, damages resulting from accident, or damages resulting from unauthorized service.

Thermal Printhead

This warranty is limited to a period of one year, (365 days), or 1,000,000 linear inches of use, whichever comes first, for the E-Class™ 4203/4204/4304 thermal printhead. This one year (365 days) warranty is valid only if a Datamax - approved thermal label media is used, as defined in the then current Datamax list of approved thermal/thermal transfer media, a copy of which is available from Datamax. Failure to use Datamax-approved media is justification for invalidation of this thermal printhead warranty. This warranty does not cover printheads which have been misused, altered, neglected, handled carelessly, or damaged due to improper cleaning or unauthorized repairs.

Warranty Service Procedures

If a defect should occur during the warranty period, the defective unit shall be returned, freight and insurance prepaid, in the original shipping containers, to Datamax at: 4501 Parkway Commerce Blvd., Orlando, Florida, 32808. A Return Material Authorization (RMA) number must be issued before the product can be returned. To open an RMA please call the Datamax Customer Service Department at (407) 523-5550. Please include your RMA number on the outside of the box and on the shipping document. Include a contact name, action desired, a detailed description of the problem(s), and examples when possible with the defective unit. Datamax shall not be responsible for any loss or damages incurred in shipping. Any warranty work to be performed by Datamax shall be subject to Datamax's confirmation that such product meets Datamax warranty. In the event of a defect covered by its warranty, Datamax will return the repaired or replaced product to the Purchaser at Datamax's cost.

With respect to a defect in hardware covered by the warranty, the warranty shall continue in effect until the end of the original warranty period, or for sixty (60) days after the repair or replacement, whichever is later.

General Warranty Provisions

Datamax makes no warranty as to the design, capability, capacity or suitability of any of its hardware, supplies, or software.

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