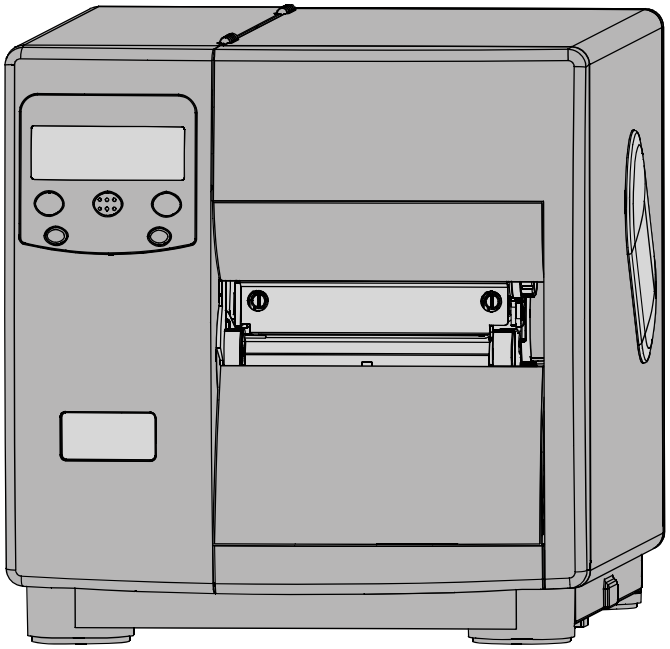
DATAMAX®

A DOVER COMPANY

I CLASS™



Operator's Manual

Copyright Information

Firmware (Software) Agreement

The enclosed Firmware (Software) resident in the Printer is owned by Licensor or its suppliers and is licensed for used only on a single printer in the user's Trade or Business. **The User agrees not to, and not to authorize or permit any other person or party to duplicate, or copy the Firmware or the information contained in the non-volatile or programmable memory.** The firmware (Software) is protected by applicable copyright laws and Licensor retains all rights not expressly granted. In no event will Licensor or its suppliers be liable for any damages or loss, including direct, incidental, economic, special, or consequential damages arising out of the use or inability to use the Firmware (Software).

Part Number: 88-2241-01

Revision: K

Agency Compliance and Approvals

UL60950 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 B
EN 50024 (1998)
EN61000-4-2 (1995), 4kV CD
EN61000-4-3 (1996), 3V (80%) AM
EN61000-4-4 (1995), 500V Signal Lines /1 kV AC Power Lines
EN61000-4-5 (1995), 1 kV
EN61000-4-6 (1996), 3V (80%) AM
EN61000-4-8 (1994), 1 A/M
EN61000-4-11 (1994)
EN61000-3-2 (1995)
EN61000-3-3 (1995)

Safety: This product complies with the requirements of IEC 60950.

Gost-R

GB4943-2001, GB9254-1998 and GB17635.1-2003

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 expense.*

DECLARATION OF CONFORMITY

(In accordance with EN 45014)

We,

Datamax Corporation
4501 Parkway Commerce Boulevard
Orlando, Florida 32808

declare under our sole responsibility that the product,

Type of Equipment: Thermal Transfer Printer
Model Number: DMX-I-4xxx

to which this declaration relates is in conformity with the following standards or other normative documents:

Safety: **The product complies with the requirements of the Low Voltage Directive 73/23/EEC, EN 60950/A11: 1997**

EMC:

EN 55022 (1993) Class B
EN 55024 (1998)
EN 61000-4-2 (1995), 4kV CD
EN 61000-4-3 (1996), 3 V/m, (80%) AM
EN 61000-4-4 (1995), 500V Signal Lines
1kV AC Power Lines
EN 61000-4-5 (1995), 1kV
EN 61000-4-6 (1996), 3V (80%) AM
EN 61000-4-8 (1994), 1 A/M
EN 61000-4-11 (1994)
EN 61000-3-2 (1995)
EN 61000-3-3 (1995)

following the provision of EMC directive 89/336/EEC.

I, the undersigned, hereby declare that the equipment specified above conforms to the directives and standards as specified.

William M Bouverie 2/7/02

Signature and Date

William Bouverie - President

Typed Name and Title

European Contact: **Datamax International**
Herbert House, 12 Elizabeth Way
Pinnacles, Harlow
Essex, CM19 5FE, U.K.

Important Safety Instructions

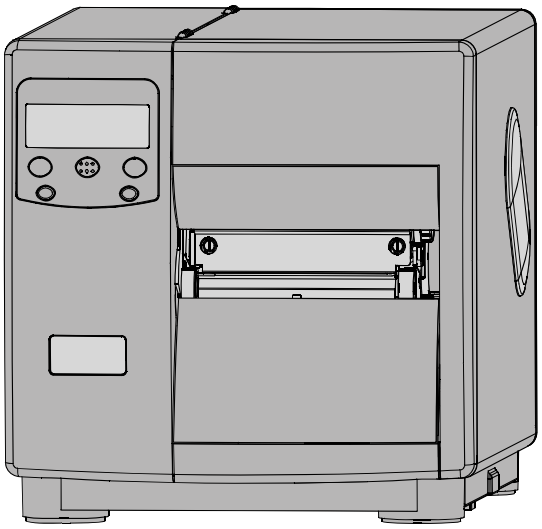
The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance instructions in the literature accompanying this unit.

This unit has been carefully designed to provide years of safe, reliable performance. As with all electrical equipment, however, there are some basic precautions that you should follow to avoid personal injury or printer damage:

- Before using the printer, carefully read all the installation and operating instructions.
- Observe all warning instruction labels on the printer.
- Install the printer on a flat, firm surface.
- Do not place the printer on or near a heat source.
- To protect your printer from overheating, make sure no openings on the printer are blocked.
- Never insert anything into the ventilation slots and openings of the printer.
- Do not use the printer near water or spill liquid into it.
- Ensure that the AC power source matches the ratings listed for the printer. (If unsure, check with your dealer or local utility provider.)
- Do not walk on the AC power cord. If the AC power cord becomes damaged or frayed, replace it immediately.
- If the printer ever needs repair, consult only qualified, trained service personnel. No user-serviceable parts are inside; do not remove the cover.

Contents

1 Overview



1.1 About the Printer

Congratulations on your purchase of an I-Class printer (hereafter referred to as “the printer”). This manual provides information regarding printer setup, operation, and care.

To print label formats, refer to the instructions provided with your labeling software; or if you wish to write custom programs, a copy of the *Class Series 2 Programmer’s Manual* can be found on the Accessories CD and at our web site at http://www.datamaxcorp.com

As detailed below, each model offers many standard and optional features that allow the printer to meet all of your label generation needs.

1.1.1 Standard Features

The model number, located on the back of the unit, defines many of the printer's standard features:

Standard Features						
Feature	I-Class Model					
	4206	4208	4212	4308	4406	4604
Direct Thermal Printing	X	X	X	X	X	X
Fan-Fold Media Handling	X	X	X	X	X	X
Flash Memory	1MB	1MB	2MB	2MB	2MB	2MB
Liquid Crystal Display	X	X	X	X	X	X
Media Tear Bar	X	X	X	X	X	X
Multi-Language Support	X	X	X	X	X	X
On-Demand and Batch Printing	X	X	X	X	X	X
Resolution (Dots Per Inch)	203	203	203	300	406	600
Rotating Media Hub	X	X	X	X	X	X
SDRAM	8MB	8MB	16MB	16MB	16MB	16MB
Scalable Font Engine	X	X	X	X	X	X
Serial & Parallel Ports	X	X	X	X	X	X

1.1.2 Optional Features *(available except as noted)*

The following optional features are offered for the printer:

Cutter, Light Duty

A rotary mechanism that cuts material with a maximum thickness of .005 inches [.127 mm] in lengths as small as 1.25 inches (31.8 mm). An adjustable collection tray (200 label capacity) can also be added.

Cutter, Standard Duty

A rotary mechanism that cuts material with a maximum thickness of .010 inches [.254 mm] in lengths as small as 1.25 inches (31.8 mm). An adjustable collection tray (200 label capacity) can also be added.

DMXNetII and DMXrfNetII

An internal wired or wireless Network Interface Controller for Ethernet connectivity with multiple operating system and protocol support, including trap functions.

External Keyboard (specify voltage & country requirement when ordering)

A portable terminal for stand-alone printing.

External Media Rewinder (specify voltage requirement when ordering)

A feature-dependant bi-directional rewinding device:

- DMXREW1 – rewinds label widths up to 4.5 inches (114 mm) into eight-inch (203 mm) outer diameter rolls on one to four inch (25 to 101 mm) diameter cores at up to ten inches per second.
- DMXREW2 – rewinds label widths up to 9.5 inches (241 mm) into twelve-inch (304 mm) outer diameter rolls on a three-inch (76 mm) diameter core at up to thirty inches per second.

GPI/O Multi-Expansion Card

A slide-in multi-feature circuit card assembly:

- Flash Memory Expansion – stores up to 8 megabytes of label formats, fonts, and graphics.
- Real Time Clock – keeps the time and date for labeling functions.
- GPIO Port **–** allows control of printing functions via an external device (e.g., a label applicator).
- ILPC Fonts (optional feature) – extends printing capabilities with CG-Times, Kanji Gothic B, Simplified Chinese GB, Korean Hangul scalable font sets.
- MCL Serial Port (optional feature) – allows use with MCL application programs and firmware.

Internal Rewinder

An internal device capable of rewinding six-inch (152 mm) outer diameter rolls of labels or backing material.

Linear Scanner (unavailable for I-4206; cannot be used with a cutter option)

A CCD device that ensures the readability of bar codes.

Peel and Present Mechanism (requires the Internal Rewinder option)

A device that peels labels from the backing material for immediate application, output-regulated to the removal of a previously printed label (minimum label length is 1.5 inches [38 mm]).

Present Sensor

A device that regulates output to the removal of a previously printed label.

RFID

An integrated Radio Frequency Identification tag encoding and reading device with data capture capabilities, available for immediate or future use:

- Factory Installed – complete, ready to use out of the box.
- Ready – factory installed antenna, requiring installation of additional hardware.

RS-422 Serial Interface (unavailable for I-4206 and I-4208 models)

Single-drop interface hardware for greater printer to host serial communication distances (at up to 38,400 baud).

Thermal Transfer (specify ribbon configuration at time of order)

A device that allows the use of ribbon ("coated side in" or "coated side out") and thermal transfer media to produce exceptional image clarity (as compared to most direct thermal media).

Twinax/Coax Interface

A slide-in circuit card that provides connectivity to AS/400 and System/3X Twinax host systems or 3270-type host systems (cabling included).

USB Port

A slide-in circuit card that provides a Universal Serial Bus (Version 1.1) interface for Windows® printing environments.

Option Installation

Field installation of the printer options, designated by type and experience level, is detailed below. (For more information, contact your dealer or Datamax Technical Support.)

Option Installations	
Option	**Recommended Installer**
Cutters / Trays – Light or Standard Duty	Operator
DMXNetII or DMXrfNetII	DMX Certified Technician
External Keyboard	Operator
External Media Rewinder	Operator
GPI/O Multi-Expansion Card	DMX Certified Technician
Internal Rewinder	Operator
Linear Scanner	DMX Certified Technician
Peel and Present Mechanism	Operator
Present Sensor	Operator
RFID-Ready	DMX Certified Technician
RS-422 Serial Interface	DMX Certified Technician
Thermal Transfer	Operator
Twinax/Coax Interface	DMX Certified Technician
USB Port	DMX Certified Technician

2 Getting Started

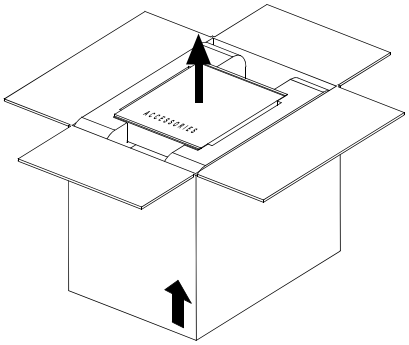
2.1 Unpacking the Printer

The printer has been carefully packaged to prevent transit damage. (Inspect the container for damage; if evident, notify the shipping company before acceptance.)

Complete the steps below to ready the printer for use:

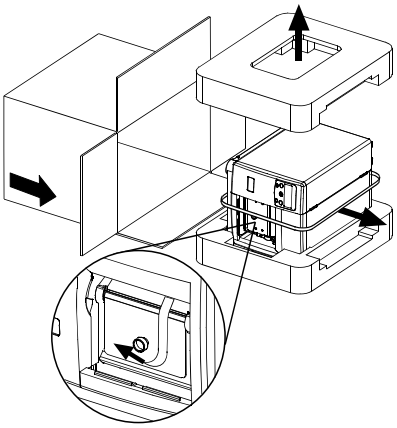
A. With the arrow pointing upward, open the box.

B. Remove Accessories Box.



C. Tilt the box sideways and then slide out the printer.

D. Place the printer in an upright position and remove the packing foam, bag, and tape.

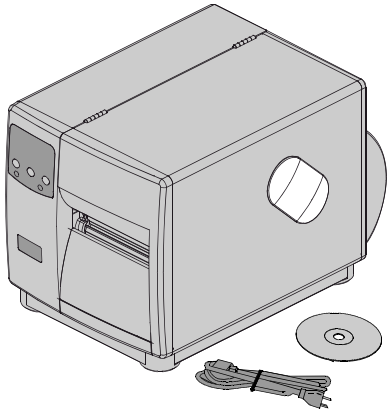


☑ **Note:** *Save the carton and packaging materials for future use.*

2.1.1 Inspection

After removing the packaging, check the contents of the shipment. The following items should be included:

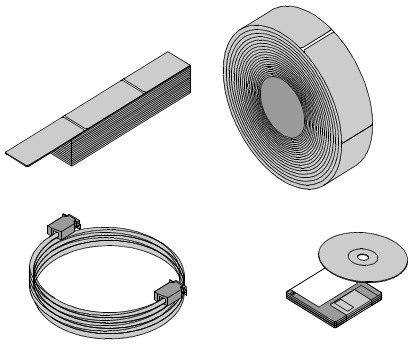
- Printer
- Power Cord
- Accessories CD
- Any special or additionally purchased items.



2.1.2 Additional Requirements

Other items can also be needed for operation:

- An interface cable; see Section 3.1.1.
- Applicable media; see Section 7.3.
- Applicable software; consult the Accessories CD-ROM and see Appendix E for details, or refer to your dealer or Datamax for information.



3 Setting up the Printer

3.1 Installation

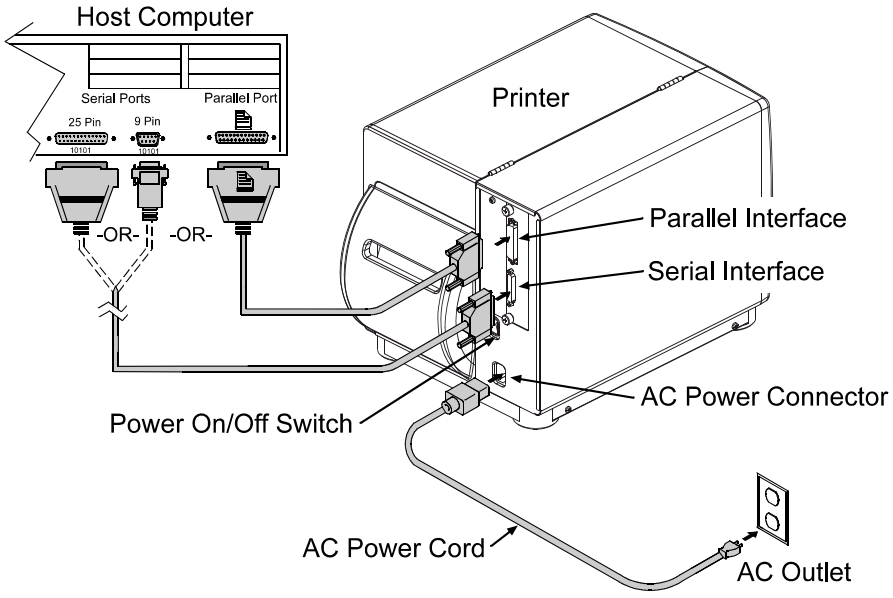
Interface and connect power to the printer:

A. Place the printer on a firm, level surface.

B. Turn OFF the Host Computer then, depending upon your system, connect an appropriate interface cable from the host to the printer; see Section 3.1.1.

C. Turn ON the Host Computer.

D. Ensure that the printer's Power On/Off Switch is in the OFF position. Connect the AC Power Cord to the AC Power Connector, and then plug the AC Power Cord into a properly grounded AC Outlet.



☑ **Note:**	*When interfacing, ensure AC power has been turned OFF, and always apply power to the Host before the Printer.*

3.1.1 Communications

Following power-up (or after a period of inactivity), interface port selection occurs automatically upon detection of valid data. If the incoming (received) data flow stops and the Host Timeout Value (see Section 4.2.6) is exceeded, partially received formats will be ignored and the port detection process repeated.

☑ ***Notes:*** *1) To change an active port immediately, cycle the power OFF and ON.*

2) For alternate data processing options, see SYSTEM SETTINGS / INPUT MODE - Section 4.2.5.

DMXNetII Network Interface Card / DMXrfNetII Wireless Network Interface Card

The optional network interface has several menu-selectable modes; see Section 4.2.6 or refer to the manual provided with the option.

Parallel Port

The parallel interface has two menu-selectable modes of operation:

- Unidirectional mode is forward channel communication and requires a Centronics® cable with a 36 pin male connector.
- Bi-directional mode is IEEE 1284 Compliant, using forward and reverse channel communications and requires an IEEE 1284 cable with a Centronics® 36 pin male connector.

Serial Port

The serial interface supports RS-232C, and if equipped optional RS-422 communications. The serial interface has menu-selectable settings that must match the host computer's settings; see Section 4.2.6. In addition to the port settings, **serial cable wiring must have specific pin connections for proper data flow**; see Section 7.3.

USB Interface Card

The optional USB Port is plug and play interface, operating transparently and without menu-selectable settings or modes.

WARNING

The USB Port is a device-end only connection. Never connect a keyboard, mouse, modem, etc. to this port; damage can result.

3.2 Media Loading

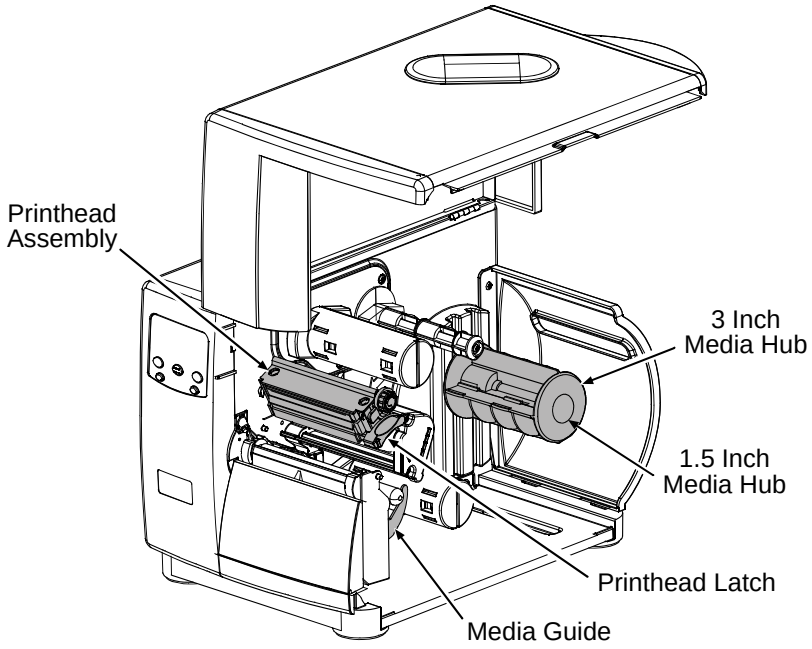
Load media according to its type:

A. Raise the cover.

B. Rotate the Printhead Latch then raise the Printhead Assembly.

C. Slide the Media Guide outward and then rotate it downward.

D. If using roll media on a 1.5-inch (38mm) core, grasp then pull firmly outward to remove the 3-Inch Media Hub; otherwise, go to Step E.

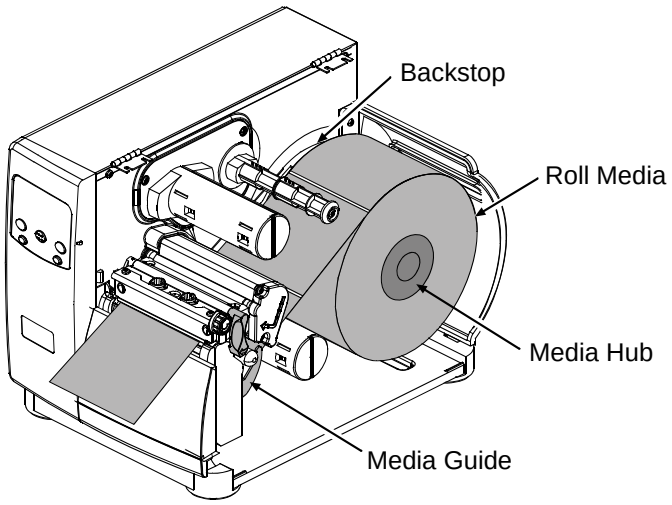


E. Proceed according to the media type:

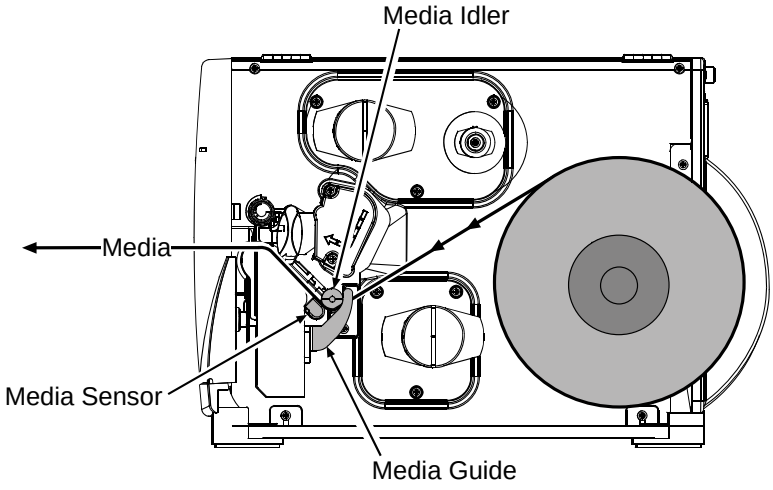
- For Roll Media, see Section 3.2.1; or,
- For Fan-Fold Media, see Section 3.2.2.

3.2.1 Loading Roll Media

A. Slide the Roll Media onto the Media Hub until it reaches the Backstop.



B. Route the Media under the Media Idler, through the Media Sensor, and then straight out the front of printer.

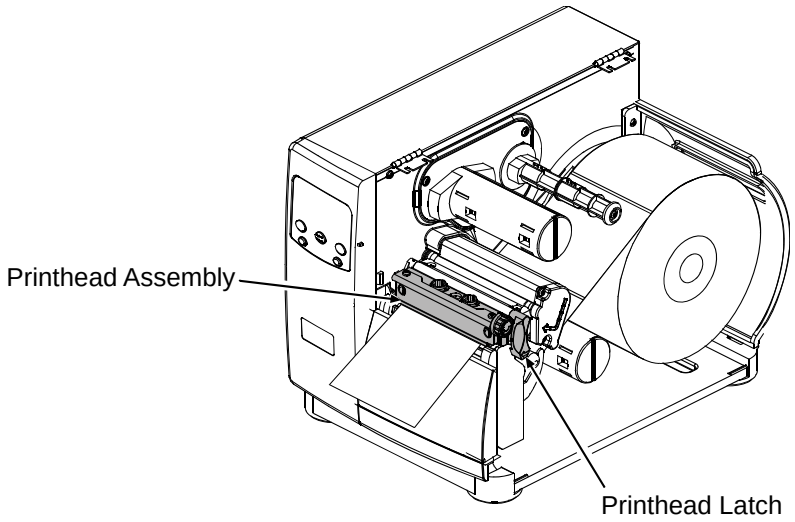


C. Raise then slide the Media Guide over so that it rests lightly against the edge of the media.

D. Position the Media Sensor; see Section 3.3.

E. If using thermal transfer media, load ribbon (see Section 3.4); otherwise, go to Step F.

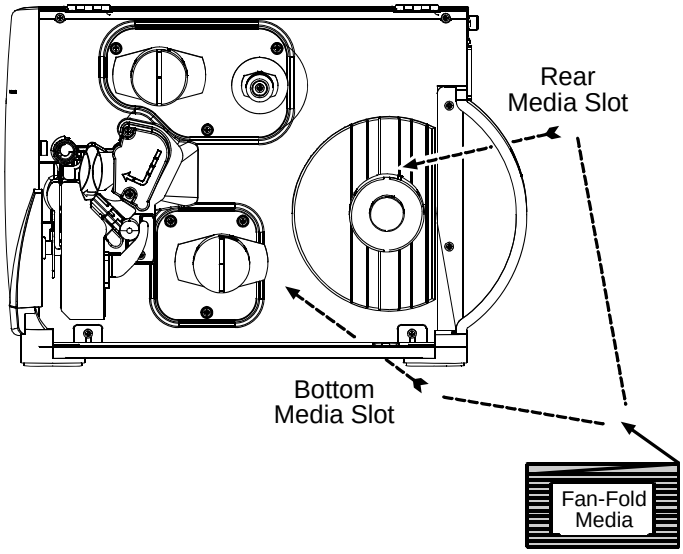
F. Lower the Printhead Assembly and rotate the Printhead Latch into the locked position. Close the cover then turn ON the printer. After READY is displayed, press and hold the FEED Key until at least one label gap (or mark) is advanced; see Section 3.5.



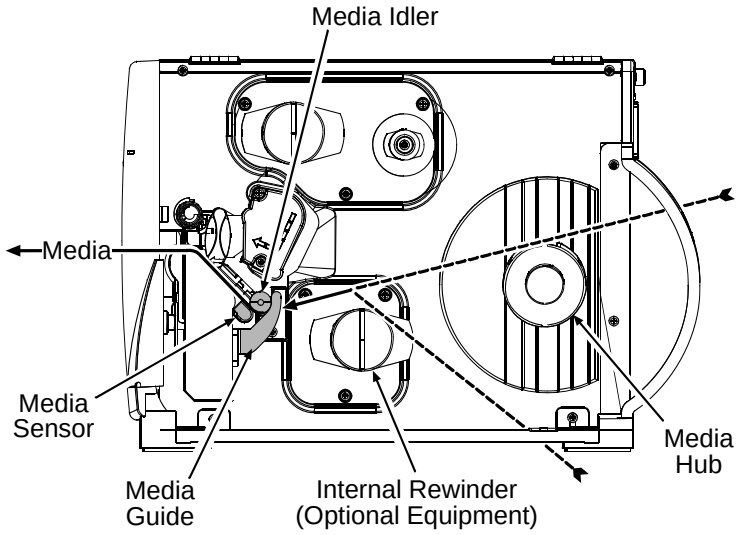
> *Adjust the Leveling Cam if your media is less than four inches (102 mm) wide; see Section 5.4.1.*

3.2.2 Loading Fan-Fold Media

A. With the Fan Fold Media source aligned to the Bottom or the Rear Media Slot, insert the media. (If using reflective media, be sure that the black mark is facedown.)



B. Route the Media under the Media Idler (also, if equipped over the Internal Rewinder; and, if through the Rear Media Slot, over the Media Hub).



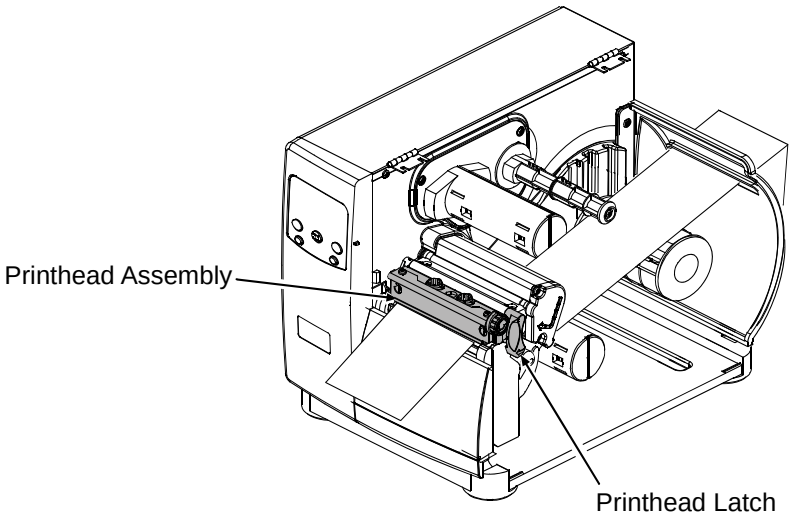
C. Pass the media through the Media Sensor then straight out the front of the printer.

D. Raise then slide the Media Guide over so that it rests lightly against the edge of the media.

E. Position the Media Sensor; see Section 3.3.

F. If using thermal transfer media, load ribbon (see Section 3.3); otherwise, go to Step G.

G. Lower the Printhead Assembly and rotate the Printhead Latch into the locked position. Close the cover then turn ON the printer. After READY is displayed, press and hold the FEED Key until at least one label gap (or mark) is advanced; see Section 3.5.



> *Adjust the Leveling Cam if your media is less than four inches (102 mm) wide; see Section 5.4.1.*

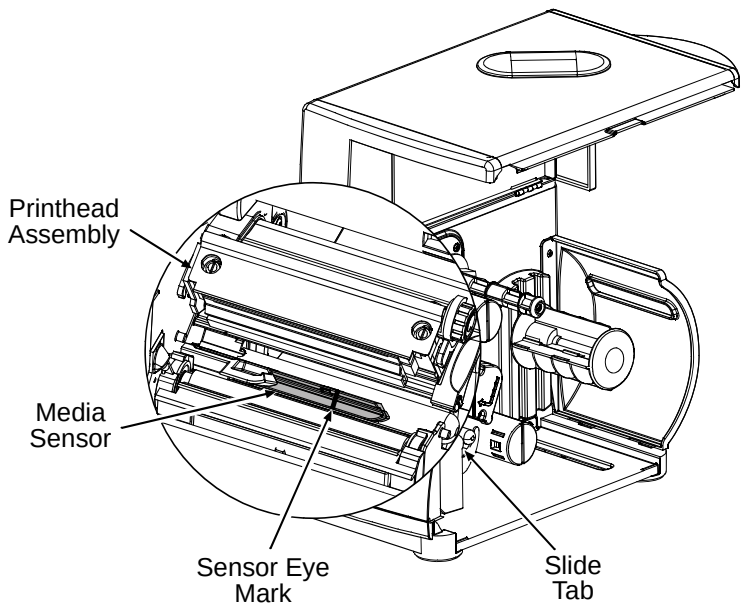
3.3 Media Sensor Adjustment

The Media Sensor detects media presence, and top-of-form (except when using continuous stock). Adjust the Media Sensor as follows:

A. With media loaded and the Printhead Assembly raised for visual access, grasp the Slide Tab of the Media Sensor.

B. Referencing the table below, use the Slide Tab to position the Sensor Eye Mark over the media according to the Media Type. (If necessary, return to the media loading section to complete the setup process.)

Media Type	Sensor Eye Mark Position
Die-cut	Near the middle of the label
Notched	Centered over the notch
Reflective	Centered over the black mark
Continuous	Near the middle of the media



☑ **Notes:** *(1) See Section 4.2.2 for SENSOR TYPE selection and the Continuous stock label size adjustment.*

(2) See Section 4.2.3 for Start of print position adjustments.

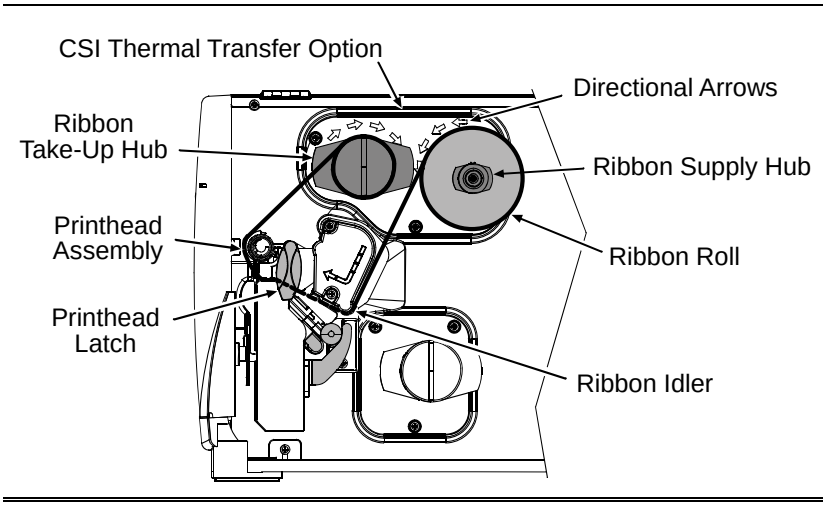
3.4 Ribbon Loading

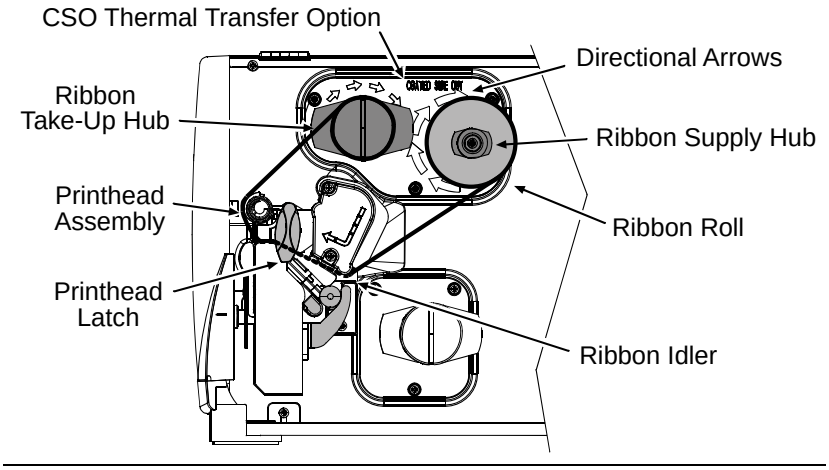
The Thermal Transfer Option type determines the applicable ribbon type (Coating Side In [CSI] or Coating Side Out [CSO]). Depending upon the option type, load ribbon as follows:

A. Unlock the Printhead Latch and raise the Printhead Assembly. Following the Directional Arrows on the Thermal Transfer Option, orient the Ribbon Roll accordingly and then slide it completely onto the Ribbon Supply Hub.

B. Route the ribbon under the Ribbon Idler and Printhead Assembly then up and around the Ribbon Take-Up Hub. Wind the ribbon several times (in a clockwise direction) around the Ribbon Take-Up Hub to secure it.

C. If loading media, return to the media loading instructions; otherwise, lower the Printhead Assembly and rotate the Printhead Latch into the locked position.





☑ **Note:** *Coating Side In and Coating Side Out ribbons are NOT interchangeable.*

Removing Used Ribbon

When the Ribbon Roll is depleted, pull the empty core from the Ribbon Supply Hub. Grasp the used roll on Ribbon Take-Up Hub then pull and squeeze to remove the spent ribbon. (To remove partially depleted rolls, cut the ribbon then remove the roll and discard any used ribbon as described above.)

3.5 Quick Calibration

☞ *If UNCALIBRATED is displayed, see Section 5.2.*

The printer is calibrated to sense a wide range of media. Calibration fine-tunes these settings for your die-cut, notched, or reflective application. (Not required for continuous media.)

Perform this calibration during initial setup or after changing your media type:

Ensure that media is loaded and that the Media Sensor is adjusted. Then, with the printer idle, press and hold the FEED Key. Allow at least one complete label to advance then release the key.

Upon successful completion, CALIBRATION COMPLETED and then READY will be displayed.

☑ ***Notes:*** *(1) WARNING LOW BACKING may appear if using notched media, or media with a transparent liner; however, calibration was successful.*

(2) Media containing large gaps may require a change in the PAPER OUT DISTANCE; see Section 4.2.2.

Calibration Hints

If the printer stops feeding mid-label, or if CANNOT CALIBRATE is displayed, try calibrating over a longer distance:

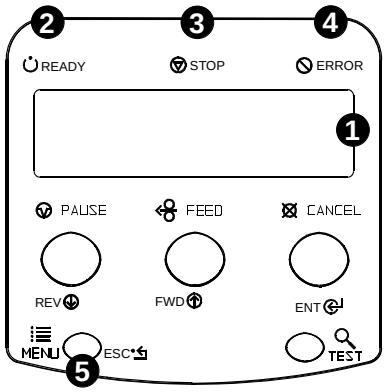
- Ensure that media is loaded and that the Media Sensor is adjusted. With the printer idle, press and hold the FEED Key. Allow two or more labels to advance and then release the key. (If this method fails, see Section 5.2).

4 Using the Front Panel

4.1 Operation

The front panel is composed of a display, indicators, and mode-dependant keys for easy access to printer operations and functions.

4.1.1 Display and Indicator Lights



❶ **Liquid Crystal Display (LCD)**

The LCD provides textual information:

- Following initialization, the READY message;
- The time and date;
- Label counts during batch jobs;
- When in Menu Mode, the System Menu; and,
- Displayed Messages.

❷ **READY**

The Ready Light provides operational state information:

- ON indicates Ready Mode;
- SLOW FLASHING indicates Menu Mode; and,
- FAST FLASHING indicates data reception.

❸ **STOP**

The Stop Light indicates a paused condition.

❹ **ERROR**

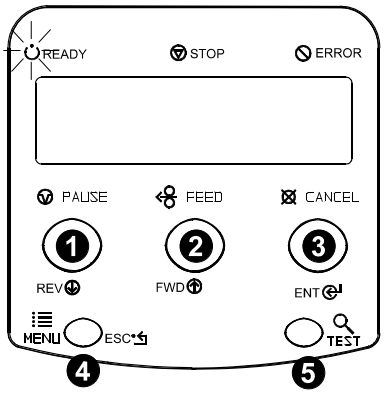
The Error Light indicates the following conditions (see Section 6.1.2):

- SLOW FLASHING indicates a Warning; and,
- FAST FLASHING indicates a Fault.

❺ MENU

The MENU Key, when pressed and held, adjusts the LCD Contrast.

4.1.2 **Ready Mode:** *Normal Operation (Ready Light ON)*



❶ **PAUSE**

The PAUSE Key temporarily suspends printing, and pressing it again returns normal operation.

❷ **FEED**

The FEED Key advances labels, and clears any corrected faults. Pressing and holding it initiates calibration; see Section 3.5.

❸ **CANCEL**

The CANCEL Key cancels the current print job and then pauses the printer. Pressing and holding it four seconds initiates a soft reset; see Section 5.3.1.

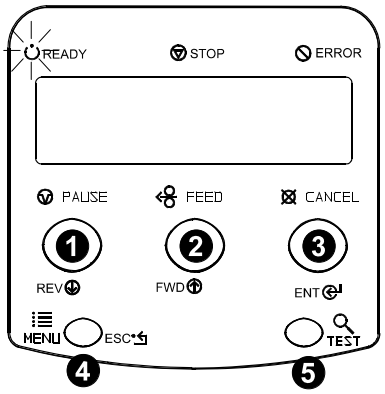
❹ MENU

The MENU Key toggles the Ready and Menu Modes (and while in Ready Mode, pressing and holding it adjusts the LCD Contrast.)

❺ **TEST**

The TEST Key enters and exits the Test Mode.

4.1.3 **Menu Mode:** *Configuration (Ready Light "Flashing")*



❶ REV

The DOWN ARROW Key scrolls to a previous menu item, and also decrements numerical values for most menu selections.

❷ FWD

The UP ARROW Key scrolls to the next menu item, and also increments numerical values in most menu selections.

❸ ENT

The ENTER Key selects the function, item, or displayed value; also moves between selections within multiple parameter fields.

❹ ESC

The ESCAPE Key moves through previous menu levels to Ready Mode.

❺ **TEST**

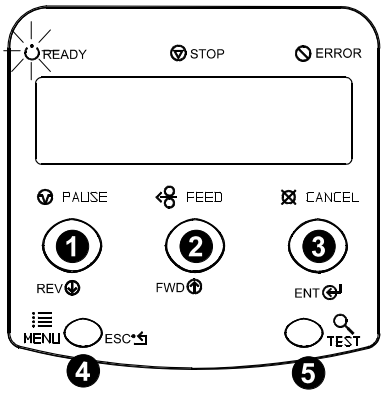
The TEST Key terminates printing then restores Menu Mode.

4.1.4 **Test Mode:** *Printing Test Labels*

> ☑ ***Note:*** *Test Mode functions are disabled while processing data from communications interfaces.*

❶ REV⊕

The DOWN ARROW Key scrolls to the previous test function.



❷ FWD⊕

The UP ARROW Key scrolls to the next test function.

❸ ENT

The ENTER Key changes the selected test label quantity (except the Configuration Label, always one), and holding down the key scrolls the quantities.

❹ ESC

The ESCAPE Key exits the Test Mode.

❺ **TEST**

The TEST Key prints the selected label at the selected quantity. During printing, this key also cancels the test. Pressing and holding it for four seconds initiates printhead cleaning; see Section 4.2.2.

> ☞ *Test print timing can be programmed using the PRINT TEST RATE; see Section 4.2.7.*

4.2 The System Menu

The MENU Key accesses seven system branches:

- MEDIA SETTINGS
- PRINT CONTROL
- PRINTER OPTIONS
- SYSTEM SETTINGS
- COMMUNICATIONS
- DIAGNOSTICS
- MCL OPTIONS

☑ **Notes:** *(1) Entering the menu takes the printer offline and halts the processing of new data.*

(2) Selected Menu items are indicated with an asterisk (*) next to the displayed setting, while items designated with a section symbol (§) require a reset to become effective.

(3) Password protection can prevent accidental or unauthorized Menu System changes; see Section 4.2.5.

(4) The commands from your host computer may, in some cases, override the menu settings; see Section 4.2.6 for setting controls.

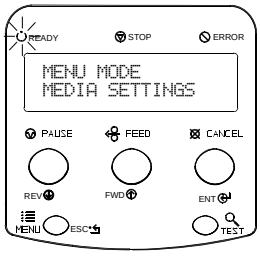
(5) Depending upon the installed firmware, some of the menu selections represented below may not appear in your printer.

(6) Options or items not detected by the printer may indicate NOT INSTALLED when accessed in the menu.

4.2.1 Entrance and Exit Prompts

Depending upon the security setting and printer configuration, the following Entrance and Exit Prompts may appear when accessing or exiting the menu (see Section 5.1.1 for other prompts).

Press the MENU Key to enter Menu Mode.



Displayed Message	Details
MENU MODE	The Menu Key has been pressed, where:
ENTER PASSWORD 0 0 0 0	Requires entry of the correct security password for menu access.
KEEP HOST CHANGES? ENTER=YES	Requires a decision regarding existing host commands that have affected the configuration of the printer, where pressing ENTER will save these changes or pressing ESC will discard them.
SAVE CHANGES? ENTER = YES	Requires a decision regarding changes that have been made to the printer's settings, where pressing ENTER will save these changes or pressing ESC will discard them. ☑ ***Note:*** *If required, a reset will automatically occur.*

The following designations are used throughout the menu listings below:

Symbol	Definition
✧	Denotes a firmware default setting or value.
♦	Denotes a setting can only be changed via the menu.

4.2.2 Media Settings

The Media Settings menu contains label and ribbon settings, and printhead maintenance selections.

Menu Item	Details
MEDIA TYPE	Selects the method used to print labels and should be set according to the type of media being used, where:
✧THERMAL TRANSFER	Sets printing for media that requires a ribbon to produce an image.
DIRECT THERMAL	Sets printing for media that is reactive to heat to produce an image.
SENSOR TYPE	Selects the Top Of Form (TOF) sensing method used to determine the leading edge of the label, where:
✧GAP	Senses the gaps or notches in the media.
CONTINUOUS	TOF sensing is not used; see LABEL LENGTH.
REFLECTIVE	Senses the reflective (black) marks on the underside of the media.
LABEL LENGTH	Determines the length of the label when the SENSOR TYPE is set to CONTINUOUS, where:
✧04.00in (0-99.99)	Is the desired length of the format.
MAXIMUM LABEL LENGTH	Sets the distance that the printer will feed GAP or REFLECTIVE media before declaring a TOF fault, where:
✧16.00in (0-99.99)	Is the length of travel to detect a TOF gap or mark. ☑ **Note:** *This distance should be 2.5 to 3 times the length of the label.*
PAPER OUT DISTANCE	Sets the Out Of Stock fault (empty) distance, where:
✧00.25in (0-99.99)	Is the attempted length of feed before empty is declared. ☑ **Note:** *If using clear or translucent media, this setting should be longer than the length of the label.*
LABEL WIDTH	Sets the maximum printable width. Objects extending beyond this limit will NOT print, where:
✧XX (X-XX)	Is the maximum width; see Appendix A for the model dependant default and range.

Media Settings (continued)

Menu Item	Details
RIBBON LOW OPTIONS	Defines the response when THERMAL TRANSFER is selected and the ribbon supply diminishes, where:
RIBBON LOW DIAMETER	Sets the threshold that will trigger a Low Ribbon Warning prompt, where:
✧1.40in (1.00 – 2.00)	Is the outer diameter size of the ribbon roll.
PAUSE ON RIBBON LOW	Sets the printer to pause when the RIBBON LOW DIAMETER setting is met, where:
ENABLED	Forces the user to press the PAUSE Key to proceed with the print job.
✧DISABLED	Allows printing to continue until ribbon empty is declared.
SENSOR CALIBRATION ♦	Selects the method used to calibrate the media sensor (see Section 5.2), where:
PERFORM CALIBRATION	Sets the values via printer calculations.
ADVANCED ENTRY	Sets the values via manual entry, where:
SENSOR LEVELS	Allows manual entry of paper, gap (or mark), and empty threshold values.
SENSOR GAIN	Adjusts the sensor sensitivity.
PRINTHEAD CLEANING	Controls the automatic cleaning alert and function, where:
CLEAN HEAD SCHEDULE ✧000 in. (* 1000)	Specifies the amount of media (times one thousand) that can be used before a print head cleaning warning will be issued (If exceeded three times, however, a fault will be declared.) ☑ ***Note:*** *Zero (000) disables this function.*
CLEAN HEAD COUNTER	Indicates the number of inches (or cm) since cleaning was last initiated.
RESET COUNTER	Resets the Clean Head Counter to zero to restart the Clean Head Schedule.
CLEAN HEAD NOW	Initiates the cleaning process then resets the Clean Head Counter; leave media installed, but remove ribbon. Also see Section 5.6.1 for other cleaning suggestions.

4.2.3 Print Control

The Print Control menu contains print quality, throughput, formatting, and custom setup functions:

Menu Item	Details
HEAT	Controls the burn-time of the printhead (selectable as "Heat" in most labeling programs), where:
✧10 (0 - 30)	Is the number based on duration, corresponding to print darkness.
PRINT SPEED	Controls the rate of label movement during printing, where:
✧XXin/sec (X - XX)	Is the speed setting; see Appendix A for the model dependant default and range. ☑ ***Note:*** *Detailed image printing may require slower speeds; alternately, faster printing may require an increased HEAT setting for sufficient energy transfer.*
FEED SPEED	Controls the rate of label movement between printing areas, where:
✧XXin/sec (X - XX)	Is the speed setting; see Appendix A for the model dependant default and range.
REVERSE SPEED	Controls the rate of label movement during backup positioning, where:
✧XXin/sec (X - XX)	Is the speed setting; see Appendix A for the default and range.
SLEW SPEED	Controls the rate of label movement between printing areas when using the GPIO option, where:
✧XXin/sec (X - XX)	Is the speed setting; see Appendix A for the default and range.
ROW OFFSET	Shifts the vertical start of print position on the label, where:
✧00.00in (0 - 99.99)	Is the offset distance; see Section 7.2.2 for label details.
COLUMN OFFSET	Shifts the horizontal, left-justified start of print position to the right without shifting the Label Width termination point to the right, where:
✧00.00 in (0 - 99.99)	Is the offset distance; see Section 7.2.2 for label details.

Print Control (continued)

Menu Item	Details
PRESENT DISTANCE	Sets the label stop position, where:
✧0.00in (0 - 4.00)	Is the label travel distance at output.
MOTOR THROTTLING	Controls the current to the stepper motor, where:
✧ENABLED	Counts labels versus time and, if needed, pauses printing to maintain a cooler motor temperature.
DISABLED	Applies motor current normally.
CUSTOM ADJUSTMENTS ♦	These selections independently change the listed parameters, allowing slight mechanical compensations sometimes evident when multiple printers share label formats or for special printer-specific formatting adjustments, where:
DARKNESS ✧32 (1 - 64)	Controls the printhead strobe time (see HEAT, above) to fine-tune the solid areas of the image.
CONTRAST ✧32 (1 – 64)	Fine-tunes the gray areas of an image.
ROW ADJUST ✧000 DOTS (⁻XXX → XXXX)	Shifts the vertical start of print position upward or downward to fine-tune the ROW OFFSET setting; see Appendix B for range and Section 7.1 for dot size.
COLUMN ADJUST ✧000 DOTS (⁻XXX → XXX)	Shifts both the horizontal start of print position and the LABEL WIDTH termination point to the right to fine-tune the COLUMN OFFSET setting; see Appendix B for range and Section 7.1 for dot size.
PRESENT ADJUST ✧000 DOTS (⁻XXX → XXX)	Adjusts the label stopping position to fine-tune the PRESENT DISTANCE setting; see Appendix B for range and Section 7.1 for dot size.

4.2.4 Printer Options

The Printer Options menu contains module, file-handling, and option functions:

Menu Item	Details
MODULES	Controls memory handling functions, where:
PRINT DIRECTORY	Prints a listing of available space, files, and types; see Appendix A.
PRINT FILE	Prints from a list of available files.
FORMAT MODULE	Formats the selected module, erasing all data.
DELETE FILE	Removes selected files from the module directory. ☑ ***Note:*** *Protected modules will not be displayed, and space will not be recovered until packed.*
PACK MODULE	Removes deleted files and defrags the module to recover memory space.
PRESENT SENSOR	Controls the Present Sensor, and the Peel and Present options, where:
MODE	Sets the detection method and response of the printer, where:
✧AUTO	Checks for the presence of the sensor and if found, the sensor is enabled; otherwise, the function is ignored.
ENABLED	Enables the sensor. If not detected, a fault is generated.
DISABLED	Disables the sensor.
RETRACT DELAY	Programs a time delay for retraction of the next label in the print job, where:
✧070 x 10mS (1 - 255)	Is the range, times 10 milliseconds.

Printer Options (continued)

Menu Item	Details
CUTTER	Controls the Cutter option, where:
MODE	Sets the detection method and response of the printer, where:
✧AUTO	Detects, enables, and sets the label stop location for the cutter; if not detected, the option will be ignored.
ENABLED	Enables and sets the label stop location for the cutter; if not detected, a fault will be generated.
DISABLED	Disables the option.
CUT BEHIND	Allows a number of small labels to queue before a cut is performed, increasing throughput, where: ☑ ***Note:*** *This mode can be used without a cutter to allow the presentation of an extra label, with retraction occurring upon the next job or feed operation.*
✧0 (0 – 2)	Is the queue number. ☑ ***Note:*** *After a fault or unknown label position, the leading edge will be cut to ensure no extra material exists at the beginning of the first label; otherwise, cutting will occur only as specified.*
SCANNER	Controls the Linear Scanner option, where:
MODE	Sets the detection method and response of the printer, where:
✧AUTO	Checks for the presence of the scanner: If found, the scanner is enabled; otherwise, it will be ignored.
ENABLED	Enables the scanner. If not detected, a fault will be generated.
DISABLED	Disables the scanner.

Printer Options (continued)

Menu Item	Details
BARCODES	Specifies the bar code types for scanning, where: ☑ **Note:** *Enabling only the bar code types that will be checked can help maximize throughput.*
✧CODE 39 ✧IATA ✧CODABAR ✧INTERLEAVED 2 OF 5 ✧INDUSTRIAL 2 OF 5 ✧CODE 93 ✧CODE 128 ✧MSI/PLESSEY ✧EAN(13/8) ✧EAN(13/8)+2 ✧EAN(13/8)+5 ✧UPC(A/E) ✧UPC(A/E)+2 ✧UPC(A/E)+5	Is / are the bar code type(s) to be checked; see the *Class Series 2 Programmer's Manual* for symbology details.
BARCODE COUNT	Specifies a number of bar codes per label and generates a fault when the number present is incorrect, where:
✧00 (0 - 99)	Sets the number of bar codes to count, where 00 (Auto Mode) allows a variable number. ☑ **Note:** *If bar codes are sent as bitmaps (i.e., imaged), enter the minimum number to be read on each label. (Check your software application for questions regarding bar code generation.)*
MIN READABLE HEIGHT	Ensures bar code integrity by setting a minimum distance for identical decodes, where:
✧DISABLED	Uses REDUNDANCY LEVEL to ensure bar code integrity.
1/16 – ½ in (1.5–12.5mm)	Sets a read distance requirement to pass the bar code (e.g., ¼ requires .25 inches to be readable). ☑ **Note:** *This distance should not exceed 50% of the measured bar code height.*

Printer Options (continued)

Menu Item	Details
REDUNDANCY LEVEL	Ensures bar code integrity by specifying a consecutive number of identical decodes, where:
✧READ BARCODE 3X	Sets a valid read count requirement (1X – 6X) to pass the bar code (e.g., 3X must return three identical decodes). ☑ **Note:** *High redundancy rates and fast print speeds may cause erroneous read failures when scanning small or multiple bar codes.*
AUTO	Uses MIN READABLE HEIGHT to ensure bar code integrity.
IGNORE NO DATA	Allows an override of data verification, where:
✧DISABLED	Checks for correct bar code data in the bar code(s).
ENABLED	Ignores the data present in the bar code(s).
SET DEFAULTS	Restores the scanner settings to the default values, where:
SET FACTORY DEFAULT? CANCEL KEY = YES	Restores the defaults, or press the ESC Key to keep the current configuration.
RFID	Controls the RFID operation, where:
SET DEFAULTS	Allows the RFID settings to return to the factory defaults, where:
✧DISABLED	Retains current settings.
ENABLED	Returns the factory settings.
RFID MODULE	Sets the mode of RFID operation, where:
✧DISABLED	Disables RFID.
HF	Selects the Securakey option.
UHF CLASS 1	Selects the Alien option.
UHF MULTI-PROTOCOL	Selects the UHF cross-platform option.

Printer Options (continued)

Menu Item	Details
RFID POSITION	Sets the RFID encoding position, where:
✧1.10in (110 - 4.00)	Is the inlay location, as referenced from the leading edge of the tag moving in the direction of print.
HF SETTINGS	Sets the HF RFID encoding settings, where:
TAG TYPE	Selects the tag type, where:
✧ISO 15693	Is the type to be encoded.
TI	
PHILIPS	
ST LRI512	
ST LRI64	
AFI VALUE	Sets the Application Family Identifier value, where:
✧00 (HEX)	Is the value (00 - FF).
AFI LOCK	Locks the AFI value, where:
✧DISABLED	Is not protected.
ENABLED	Is write-protected.
DSFID VALUE	Sets the Data Storage Format Identifier value, where:
✧00 (HEX)	Is the value (00 - FF).
DSFID LOCK	Locks the DSFID value, where:
✧DISABLED	Is not protected.
ENABLED	Is write-protected.
EAS VALUE	Selects the Electronic Article Surveillance value, where:
✧00 (HEX)	Is the value (00 - FF).
AUDIO INDICATOR	N/A

Printer Options (continued)

Menu Item	Details
ERASE ON FAULT	Allows tag data erasure when errors are detected, where:
✧DISABLED	Keeps data.
ENABLED	Erases bad data.
UHF SETTINGS	Sets the UHF RFID encoding settings, where:
TAG TYPE	Selects the tag type, where:
✧GEN 2	Is the type to be encoded.
EPC 0	
EPC 0+ MATRICS	
EPC 0+ IMPINJ	
EPC 1	
UCODE EPC 1.19	
EM 4022/4222	
TAG DATA SIZE	Sets the tag data size, where:
✧96-BIT	Selects 96 bits.
64-BIT	Selects 64 bits.
POWER ADJUST (dBMs)	Adjusts the applied power, where:
✧000 (-04 → 004)	Is the power level, in decibels.
KILL CODE	Code to permanently deactivate the tag, where:
00 00 00 00	Is the code, in the form B3, B2, B1, B0.
ACCESS CODE	Code to protect tag memory contents, where:
00 00 00 00	Is the code, in the form B3, B2, B1, B0.

Printer Options (continued)

Menu Item	Details
GEN 2 LOCK ACTION	Sets the lock for Gen 2 tags, where:
✧NONE	Does not lock the tag.
PERMALOCK	Locks data permanently.
PWD-READ/WRITE	Locks data with password-protection for writing data.
BOTH	Allows both Permalock and PWD-Lock to be used.
LOCK CODE (ALIEN HW)	Sets the lock code for Alien Gen 2 tags, where:
✧00 (HEX)	Is the code (00 - FF).
LOCK AFTER WRITE	Locks the tag after programming, where:
✧DISABLED	No lock occurs.
ENABLED	Locks the tag.
RETRY ATTEMPTS	Sets the number of retry attempts, where:
✧3 (0 - 9)	Is the retry count before a fault is declared.
AUTO DETECT TAG	Allows the printer to establish the tag to transducer distance setting. CALIBRATING RFID will appear as media is scanned for the tag location. Upon completion, the media will be retracted to the TOF position with the positioning results (along with a brief SUCCESS or FAILURE message).

Printer Options (continued)

Menu Item	Details
GPIO PORT	Controls the GPIO operation, where:
GPIO DEVICE	Sets the GPIO option to work with a specific device type, where:
✧APPLICATOR	Enables the following GPIO functions: • De-asserts Data Ready when the last label starts printing to indicate completion; • FEED allowed at any time; and, • Does not de-assert DRDY upon PAUSE.
APPLICATOR2	Enables the following GPIO functions: • Data Ready overlaps End of Print by about 1 msec. to indicate completion; • DRDY signal end inhibits FEED; and, • De-asserts Data Ready upon PAUSE or FAULT.
BARCODE VERIFIER	Enables the GPIO Port to work with a bar code verifier.
DISABLED	Disables the option.
START OF PRINT	Selects the type of input signal required to initiate Start of Print (SOP), where:
✧ACTIVE HIGH	Triggers printing with a high signal.
EDGE	Triggers printing with a signal edge transition.
LOW PULSE	Triggers printing with a low pulse.
HIGH PULSE	Triggers printing with a high pulse.
ACTIVE LOW	Triggers printing with a low signal.

Printer Options (continued)

Menu Item	Details
END OF PRINT	Sets the type of output signal generated to indicate End of Print (EOP), where:
✧LOW PULSE	Outputs a low pulse upon completion.
HIGH PULSE	Outputs a high pulse upon completion.
ACTIVE LOW	Outputs a logic low upon completion.
ACTIVE HIGH	Outputs a logic high upon completion.
RIBBON LOW	Sets the output signal type generated to indicate a low ribbon condition (as determined by the RIBBON LOW DIAMETER setting), where:
✧ACTIVE LOW	Outputs a logic low when the roll reaches the setting.
ACTIVE HIGH	Outputs a logic high when the roll reaches the setting.
SLEW ENABLE	Selects the type of input signal required to initiate label slew, where:
✧STANDARD	Triggers slew with a low signal.
LOW PULSE	Triggers slew with a low pulse.
HIGH PULSE	Triggers slew with a high pulse.
ACTIVE LOW	Triggers slew with a low signal.
ACTIVE HIGH	Triggers slew with a high signal.
BACKUP LABEL	Positions a presented label for printing (provided the PRESENT DISTANCE setting is greater than zero), where:
✧DISABLED	Disables backup positioning.
ACTIVE LOW	Positions the label when a logic low is received.
ACTIVE HIGH	Positions the label when a logic high is received.

4.2.5 System Settings

The System Settings menu contains operating, control, and formatting functions:

Menu Item	Details
CONFIGURATION FILE	Controls the creation, storage, and recall of printer configuration files (see Appendix D), where:
RESTORE AS CURRENT	Lists the files available, and then after selection reconfigures the printer according to that file.
SAVE SETTING AS	Saves the effective configuration of the printer to a named file of up to nineteen characters.
DELETE FILE	Lists the files available, and then after selection, removes that file from memory. ☑ ***Note:*** *A currently activated file cannot be deleted.*
FACTORY SETTING FILE	Lists the files available and then after selection that file will be restored whenever a Level One reset is performed; see Section 5.3.2.
✧NONE	Is the currently selected file.
INTERNAL MODULE D	Allocates a number of 1KB memory blocks for internal Memory Module D; where:
✧1024 K (XXX - XXXX)	Is the memory allocation; see Appendix A for the memory ranges, types, and availability.
DEFAULT MODULE	Designates the memory module for storage when no other location is specified; where:
✧D	Is the module; see Appendix A for availability.
SCALEABLE FONT CACHE	Configures the number of 1KB memory blocks for the scaleable font engine; where:
✧0312 K (100 - 5120)	Is the memory allocation; see Appendix A for availability.
SINGLE BYTE SYMBOLS	Selects from the 66 available code pages used for single byte fonts (unless otherwise specified in DPL); where:
✧PC_850 MULTILINGUAL	Is the selected code page; for details see the *Class Series 2 Programmer's Manual*.

System Settings (continued)

Menu Item	Details
DOUBLE BYTE SYMBOLS	Selects the code page used for double byte fonts when equipped with the ILPC option, unless otherwise specified in DPL (see the *Class Series 2 Programmer's Manual*); where:
✧UNICODE	Selects Unicode (including Korean).
GB	Selects Government Bureau Industry Standard; Chinese (PRC).
BIG 5	Selects Taiwan encoded.
JIS	Selects Japanese Industry Standard.
SHIFT JIS	Selects Shift Japanese Industry Standard.
EUC	Selects Extended UNIX Code.
TIME AND DATE	Allows the user to set the time and date; where:
SET HOUR 06:30AM 01JAN2000	Enters the information for the time and date fields. ☑ ***Note:*** *Time and date retention (after power removal) requires the Real Time Clock function; see GPI/O Multi-Expansion CCA, Section 1.1.2.*
MEDIA COUNTERS	Provides a recorded count of inches printed and time; where:
ABSOLUTE COUNTER	Shows the total number of inches printed and the set date. (Non-resettable)
RESETTABLE COUNTER	Shows the number of inches printed and the last reset date.
RESET COUNTER	Returns the RESETTABLE COUNTER to zero.
PRINT CONFIGURATION	Prints a Configuration Label of current database information where items denoted with the section (§) and bullet (•) symbol indicate changes not yet saved.

System Settings (continued)

Menu Item	Details
CONFIGURATION LEVEL	Displays the hardware and software feature level of the printer, where:
PRINTER KEY	Identifies the unique key number of the printer, in the form vvvv-wwxx-yyyyyy-zzz Where: vvvv – Represents the printer model number. wwxx – Represents the hardware and software levels, where: ww – Represents the main logic card type: PA = CCA 51-2178-XX; or TB = CCA 51-2301-XX xx – Represents the software feature level: 10 = Standard DPL 11 = 4208 20 = Internal CG Times Font yyyyyy – Is a manufacturing date code. zzz – Is a unique time stamp.
APPLICATION VERSION	Displays the level, version number, and date of the application firmware.
BOOT LOADER	Displays the Boot Loader version level and date.
UPGRADE PRINTER CODE 0 0 0 0 0 0	Upgrades the printer to the corresponding feature level. (Authorization required.)
UNLOCK FEATURE 0 0 0 0 0 0	Unlocks a corresponding feature with the entry of the correct code.
SET FACTORY DEFAULTS	Returns the printer settings to the factory-programmed values or the Factory Setting File values, where:
SET FACTORY DEFAULT? CANCEL KEY = YES	Overwrites the current configuration and restores the default configuration (✧), or if selected the Factory Setting File. Otherwise, press the ESC Key to keep the current configuration. ☑ ***Note:*** *The reset will be automatic. If no Factory Setting File is used, all menu settings will be restored except CUSTOM ADJUSTMENTS and calibrations.*

System Settings (continued)

Menu Item	Details
FORMAT ATTRIBUTES	Defines the way overlapping text, bar codes, and graphics are printed, where:
✧XOR	Does not print intersecting areas, for example: 
OPAQUE	Overwrites intersecting areas with those last formatted, for example: 
TRANSPARENT	Prints intersecting areas, for example: 
LABEL ROTATION	Allows the label format to be rotated 180 degrees, where:
✧DISABLED	Prints formats without rotation.
ENABLED	Prints flipped formats.
IMAGING MODE ♦	Determines the process used to format labels, where:
✧MULTIPLE LABEL	Formats multiple images, as memory permits, to achieve the fastest throughput. ☑ ***Note:*** *If time-stamping, the indicated time will reflect the moment of imaging rather than printing.*
SINGLE LABEL	Formats an image only after a previous format has been printed to achieve the most accurate time-stamps.
PAUSE MODE	Allows controlled interactive printing, where:
✧DISABLED	Prints labels without pausing.
ENABLED	Requires the user to press the PAUSE Key to print each label.
PEEL MODE	Allows the Start of Print signal to initiate (via the optional GPIO Port) the feeding of the labels, where:
✧DISABLED	Feeds labels regardless of the Start of Print signal.
ENABLED	Inhibits the feed function until the Start of Print signal is received.

System Settings (continued)

Menu Item	Details
SECURITY ♦	Allows the System and Test Menus to be password-protected, where:
SELECT SECURITY	Enables or disables the security feature, where:
✧DISABLED	Allows entry.
SECURE MENU	Sets a password requirement for menu entry.
MENU AND TEST	Sets a password requirement for menu and test entries.
MODIFY PASSWORD	Modifies the four-digit password required when security is enabled, where:
MODIFY PASSWORD? CANCEL KEY = YES	Enters the password (after confirmation); otherwise, press the ESC Key to keep the current password. ☑ ***Note:*** *To be activated, the default password (0000) must be changed.*
UNITS OF MEASURE	Sets the measurement standard for the printer, where:
✧IMPERIAL	Uses inches.
METRIC	Uses millimeters and centimeters.
INPUT MODE	Defines the type of processing that occurs when data is received, where:
✧DPL	Processes the data for standard DPL printing; see the *Class Series 2 Programmer's Manual*.
LINE	Processes the data for template (Line Mode) printing; see the *Class Series 2 Programmer's Manual*.
AUTO	Identifies the incoming printer language then activates the appropriate emulation parser for the data. ☑ ***Note:*** *Correct identification can be dependant upon the HOST SETTINGS / HOST TIMEOUT value (see Section 4.2.6).*

System Settings (continued)

Menu Item	Details
COLUMN EMULATION	Allows the column dot count to be adjusted, where:
✧XXX DOTS (XXX - XXX)	Selects the number of dots per inch (or mm) in which to print the format, reducing it from right to left; see Appendix B for range and Section 7.1 for dot size. ☑ ***Note:*** *No adjustment occurs at the default setting.*
ROW EMULATION	Allows the row dot count to be adjusted, where:
✧XXX DOTS (XXX - XXX)	Selects the number of dots per inch (or mm) in which to print the format, reducing or enlarging it from top to bottom; see Appendix B for range and Section 7.1 for dot size. ☑ ***Note:*** *No adjustment occurs at the default setting.*
SOP EMULATION	Allows start of print commands to function with backward compatibility when printing legacy model label formats, where: ☑ ***Note:*** *The printer may automatically feed labels to setup the print position.*
✧DISABLED	Uses the normal position.
110 (PRODPLUS)	Emulates the Prodigy Plus® position.
220 (ALLEGRO)	Emulates the Allegro® position.
250 (PRODIGY)	Emulates the Prodigy™ position.

System Settings (continued)

Menu Item	Details
BACK AFTER PRINT	Determines label movement timing when a cutter, present sensor, peel and present, or GPIO option is enabled, where:
MODE	Repositions media, where:
✧DISABLED	Moves media only when the next label is ready to print, minimizing edge curling.
ENABLED	Moves media according to BACKUP DELAY timing after a cut, cleared sensor, or GPIO start of print signal to allow fastest throughput.
BACKUP DELAY (1/50s)	Determines repositioning timing, where:
✧000 (0 – 255)	Is the specified time lapse (in fiftieth of a second increments) after the next label format is received and processed to delay media repositioning.
FONT EMULATION	Allows font substitution of internal fonts, where:
✧STANDARD FONTS	Prints using a standard (internal) font; see the *Class Series 2 Programmer's Manual*.
CGTIMES	Prints using the CG Times font.
USER ID S50	Prints using a downloaded font.
LABEL STORE	Determines the command recall level used when retrieving stored label formats, where:
✧STATE & FIELDS	Recalls the printer state (i.e., heat, speeds, etc.) and the formatting commands for the stored label.
FIELDS ONLY	Recalls the formatting commands for the stored label.
MENU LANGUAGE ♦	Selects the display language for the menu and Configuration Label, where: ☑ **Note:** *Only resident languages will be selectable; see Appendix C.*
✧ENGLISH	Enables English.
FRANCAIS	Enables French.
ITALIANO	Enables Italian.
DEUTSCH	Enables German.
ESPANOL	Enables Spanish.

System Settings (continued)

Menu Item	Details
FAULT HANDLING ♦	Determines the intervention requirement and the label disposition when a fault occurs, where:
LEVEL	Selects the user action and the reprint status upon declaration of a fault, where:
✧STANDARD	Printing stops and a fault message is displayed. Following correction of the problem, the FEED Key must be pressed to clear the fault and reprint the label in process.
VOID AND RETRY	Actions depend upon the RETRY COUNT: • If the count has not been exceeded, VOID is printed on the failed label and reprinting automatically occurs; • If the count has been exceeded, printing stops and a fault message is displayed. Following correction of the problem, the FEED Key must be pressed to clear the fault before the label in process is reprinted; or, • If the CANCEL Key is pressed, reprinting is optional: press NO to reprint; or, press YES to cancel the reprint (and press YES again to cancel the batch.) ☑ ***Notes:*** *(1) If no Linear Scanner is attached, the printer will perform in the STANDARD setting, except that VOID will be printed on the faulted label.* *(2) VOID will not be printed if insufficient space exists (see VOID DISTANCE, below), or if the fault occurred after printing.* *(3) The text can be customized, see the* Class Series 2 Programmer's Manual.
DELAYED SCAN FAULT	Increases throughput when bar codes reside near the trailing edge of the label (in the direction of FEED). ☑ ***Notes:*** *(1) If unreadable, the fault will occur after the next label prints.* *(2) The label immediately following a faulted label is not scanned for errors.* *(3) VOID AND RETRY and REPRINT are automatically disabled; the job can only be cancelled.*
NO REPRINT	Printing stops and a fault message is displayed. Following correction of the problem, the FEED Key must be pressed to clear the fault.

System Settings (continued)

Menu Item	Details
VOID DISTANCE	Sets the distance to backup and then print VOID on a faulted label, where:
✧0.50in (10 – 2.00)	Is the distance, measured from the label's trailing edge, which indirectly establishes the text font size.
RETRY COUNT	Sets the number of label reprinting attempts, where:
✧1 (0 - 3)	Is the count when reprinting stops and a fault is declared.
BACKFEED ON CLEAR	Determines the printer's action after a fault is cleared, where:
✧DISABLED	Does not position the label; the current position is assumed correct. ☑ **Note:** *If reloading media, the user must place the material in its presented position.*
ENABLED	Positions the label after the fault is cleared.

4.2.6 Communications

The Communications menu contains interface port and host control functions:

Menu Item	Details
SERIAL PORT A ♦	Controls the RS-232 communications settings for Serial Port A, where:
BAUD RATE	Sets the serial communication rate, where:
✧9600 BPS	Is the speed in Bits Per Second.
19200 BPS	
28800 BPS	
38400 BPS	
57600 BPS	
115000 BPS	
1200 BPS	
2400 BPS	
4800 BPS	

Communications (continued)

Menu Item	Details
PROTOCOL	Sets the data flow control (handshaking) method.
✧BOTH	Uses XON/XOFF and CTS/DTR flow control.
SOFTWARE	XON/XOFF
HARDWARE	CTS/DTR
NONE	Flow control is not used.
PARITY	Sets word parity, where:
✧NONE	Uses parity.
ODD	Uses odd parity.
EVEN	Uses even parity.
DATA BITS	Sets Word length, where:
✧8 (7 - 8)	Is the number of bits in the word.
STOP BITS	Sets the number of stop bits, where:
✧1 (1 - 2)	Is the stop bit count.
SERIAL PORT B ♦	Controls the RS-232 communications settings for optional Serial Port B; see SERIAL PORT A. ☑ ***Note:*** *The maximum baud is 38.4K BPS.*
SERIAL PORT C ♦	Controls the RS-232 communications settings for optional Serial Port C; see SERIAL PORT A. ☑ ***Note:*** *The maximum baud is 38.4K BPS.*
SERIAL PORT D ♦	Controls the RS-232 communications settings for optional Serial Port D; see SERIAL PORT A. ☑ ***Note:*** *The maximum baud is 38.4K BPS.*

Communications (continued)

Menu Item	Details
PARALLEL PORT A ♦	Controls the communications settings for Parallel Port A, where:
PORT DIRECTION	Allows data return from the printer, where:
✧UNI-DIRECTIONAL	Returns no data; communication is one-way.
BI-DIRECTIONAL	Returns data (compliant back-channel operation).
PARALLEL PORT B ♦	Controls the communications settings for optional Parallel Port B; see PARALLEL PORT A. ☑ ***Note:*** *The default setting is BI-DIRECTIONAL.*
NIC ADAPTER ♦	Controls the communications settings for the network interface, where:
QUICK SETUP	☑ ***Note:*** *This menu selection is only for printers equipped with the NetII or rfNetII option.* Selects settings to configure basic Wired or WiFi operations, where:
WIRED DHCP	Selects Wired operation, where:
WIRED DHCP? CANCEL KEY = YES	Returns the NIC Adapter to defaults then sets Wired Discovery to “Enable” and Wireless to “Disable.”
WLAN UNSECURED	Selects WiFi operation, where:
WLAN UNSECURED? CANCEL KEY = YES	Returns the NIC Adapter default values then sets Discovery to “Enable,” SSID to “Any,” and WLAN network type to “Infrastructure.”
WLAN ADHOC	Selects the DMXrfNETII default parameters, where:
WLAN ADHOC? CANCEL KEY = YES	Restores the WiFi defaults and initiates infrastructure mode with an SSID of “Any.” All existing access point associations will be deleted then established with the closest available. (Useful when moving the printer to a geographically distant location.) ☑ ***Note:*** *Press the ESC Key to exit the menu item without changing the current settings.*

Communications (continued)

Menu Item	Details
SET FACTORY DEFAULTS	Returns the factory-programmed values, where:
SET DEFAULTS? CANCEL KEY = YES	Restores the default settings. ☑ **Note:** *Press the ESC Key to exit the menu item without changing the current settings.*
WLAN	Controls the communications settings for the optional DMXrfNETII Card, where:
MODE	Selects between Wired or WiFi operation, where:
✧ENABLED	Enables the WiFi interface.
DISABLED	Enables the Wired interface.
BSS ADDRESS	Specifies the WiFi bridge module's static IP address. ☑ **Note:** *If DHCP is ENABLED, this parameter will be ignored.*
✧ 192.168.010.001	Is the address in standard octet format.
SIGNAL READINGS	Disabled function.
IP ADDRESS	Specifies the static IP Address; where:
✧192.168.010.026	Is the address in standard octet format.
SUBNET MASK	Specifies the static Subnet Mask Address, where:
✧255.255.255.000	Is the address in standard octet format.
GATEWAY	Specifies the network Gateway Address, where:
✧192.168.010.026	Is the address in standard octet format.
SNMPTRAP DESTINATION	Specifies the SNMP Trap Address, where:
✧000.000.000.000	Is the address in standard octet format where SNMP traps will be sent when SNMP service is installed on your receiver. ☑ **Note:** *When zeroed, no traps are sent.*

Communications (continued)

Menu Item	Details
IP DISCOVERY	Controls IP Address discovery, where:
✧ENABLED	Broadcasts over the network at startup to receive addresses from the responsible server. Manual modifications to IP Address, Subnet Mask, or Gateway are not allowed; and, if no server is found, the specified static value will be used.
	WARNING *A server assigned IP address takes precedence over any static address stored in the interface.*
DISABLED	Uses the stored static IP, Subnet Mask, and / or Gateway Address.
SNMP	Allows management protocols, where:
✧ENABLED	Sends messages to SNMP-compliant devices.
DISABLED	Sends no messages.
ADVANCED	Sets advanced networking functions and parameters, where:
TELNET	Sets Telnet protocol to transfer data, where:
✧ENABLED	Allows Telnet.
DISABLED	Disables Telnet.
FTP	Sets File Transfer Protocol to transfer data, where:
✧ENABLED	Allows FTP.
DISABLED	Disables FTP.
MTU	Sets the Maximum Transmission Unit packet size, where:
✧01500 (512 - 65515)	Is the packet size, in bytes.

Communications (continued)

Menu Item	Details
GRATUITOUS ARP	Sets the Address Resolution Protocol notification rate, where:
✧0000 (0 - 2048)	Is the time, in minutes.
PORT NUMBER	Sets the network communications port, where:
✧09100 (1 - 65535)	Is the Port Number.
DUPLEX CAPABILITY	Sets the communication capability for the Wired network, where:
✧AUTO-NEGOTIATE	Automatically selects the best type.
100BASET HALF	Selects 100 Mbit/s half duplex (in both directions, one way at a time) operation.
100BASET FULL	Selects 100 Mbit/s full duplex (in both directions, simultaneously) operation.
10BASET HALF	Selects 10 Mbit/s half duplex (in both directions, one way at a time) operation.
10BASET FULL	Selects 10 Mbit/s full duplex (in both directions, simultaneously) operation.
ADVERTISE CAPABILITY	Transmits the printer's communication capability for the Wired network, where:
✧AUTOMATIC	Advertises the DUPLEX CAPABILITY set value.
ALL CAPABILITIES	Advertises all possible values for DUPLEX CAPABILITY.
NETWORK REPORT	Prints a network status report (see example below):

```
NETWORK REPORT
  CURRENT PRINTER INFO
    MACO:  00:0D:70:0B:8B:B9
    IP ADDRESS:  192.168.10.26
    SUBNET MASK:  255.255.255.0
    GATEWAY:  192.168.10.26
    DHCP:  ENABLED
    SNMP:  ENABLED
    PORT NUMBER:  9100
    NETBIOS NAME:  DMX_000000
  WLAN MODULE
    MODULE FW VERSION:  4.3.0.24
    RADIO FW VERSION:  1.1.1.111.8.4.0.145
    PORT STATUS:  CONNECTED:  ADHOC
    SSID:  any
    MACR:  00:90:C9:01:D0:64
    BSS ADDRESS:  PROVIDED BY DHCP
```

Menu Item	Details
SET FACTORY DEFAULTS	Returns the NIC to factory-programmed values, where:
SET FACTORY DEFAULTS? CANCEL KEY = YES	Restores the default settings. ☑ **Note:** *Press the ESC Key to exit the menu item without changing the current settings.*
HOST SETTINGS	Sets host communication parameters; where:
HOST TIMEOUT	Sets the period that an interface port can be idle before timeout occurs, where:
✧10 SEC (1 - 60)	Is the time (in seconds) when downloads timeout, and that must elapse before alternate port or alternate parser processing can occur.
CONTROL CODES ♦	Allows changes to the software command interpretation controls, where:
✧STANDARD CODES	Sets the following command interpretation codes: Hex 01 = SOH command; Hex 02 = STX command; count-by = ^; Hex 1B = ESC; Hex 0x0D = Carriage Return
ALTERNATE CODES	Sets the following command interpretation codes: Hex 5E = SOH command; Hex 7E = STX command; count-by = @; Hex 1B = ESC; Hex 0x0D = Carriage Return
ALTERNATE CODES 2	Sets the following command interpretation codes: Hex 5E = SOH command; Hex 7E = STX command; count-by = @; Hex 1B = ESC; Hex 0x7C = Carriage Return
CUSTOM CODES	Sets the command interpretation codes as needed, where:
SOH STX CR CNTBY ✧5E ✧7E ✧0D ✧40	Are the codes according to your definitions.
FEEDBACK CHARACTERS	Allows the printer to return codes to the host after each label and batch successfully prints, where:
✧DISABLED	Does not send feedback characters.
ENABLED	Sends the host a Hex 1E (RS) after each label and a Hex 1F (US) after each label batch successfully prints.

Communications (continued)

Menu Item	Details
ESC SEQUENCES	Allows data containing invalid ESC control code sequences to be processed, where:
✧ENABLED	Processes commands normally.
DISABLED	Ignores ESC sequences during processing (since some systems send a "banner" to the printer). ☑ **Note:** *Bitmapped font downloads are disabled in this mode.*
HEAT COMMAND	Determines how a host software Heat command is handled, where:
✧ENABLED	Processes commands normally.
DISABLED	Ignores commands; instead, Heat is controlled via the menu setting; see Section 4.2.3.
SPEED COMMANDS	Determines how host software Print, Feed, Reverse, and Slew commands are handled, where:
✧ENABLED	Processes commands normally.
DISABLED	Ignores commands; instead, the speeds are controlled via the menu setting; see Section 4.2.3.
TOF SENSING COMMANDS	Determines how host software Gap, Continuous, and Reflective commands are handled, where:
✧ENABLED	Processes commands normally.
DISABLED	Ignores commands; instead, Sensor Type is controlled via the menu setting; see Section 4.2.3.
SYMBOL SET COMMAND	Determines how host Single and Double Symbol Set commands are handled, where:
✧ENABLED	Processes commands normally.
DISABLED	Ignores commands; instead, the Symbol Set selection is controlled via the menu setting; see Section 4.2.5.

Communications (continued)

Menu Item	Details
CNTRL-CODES (DATA)	Determines how host software Control Codes are handled, where:
✧ENABLED	Processes commands normally.
DISABLED	Ignores commands; instead, the SOH, STX, CR, ESC, and ^ codes are controlled via the menu setting; see Section 4.2.5.
STX-V SW SETTINGS	Determines how a host software option-enable (<STX>V) command is handled, where:
✧ENABLED	Processes commands normally.
DISABLED	Ignores the command; instead, option selections are controlled via menu settings; see Section 4.2.4.
MAX LENGTH COMMAND	Determines how a host software Maximum Label Length (<STX>M) command is handled, where:
✧ENABLED	Processes commands normally.
DISABLED	Ignores the command; instead, Maximum Label Length is controlled via menu settings; see Section 4.2.2.
OPTION FEEDBACK	Allows feedback characters from an optional device to be returned to the host device, in the format of <A;B;C;D;E;F>[CR], where: A - Is the device type: R = RFID; and, S = Linear Scanner B - Is the resulting status: C = entire label complete; F = faulted (failed) label; and, U = unknown C - Is the number of expected reads for bar codes or tags, given in two characters. D - Is the number of good reads for bar codes or tags, given in two characters. E - Is the printer's internal Job and Sub Job Identifier, given in four characters each. F - Is the data that was read, delimited with semicolons (;) on multiple reads.
✧DISABLED	Reports no data.
SCANNER	Reports Linear Scanner data.
RFID HEX	Reports RFID data in hexadecimal format.
RFID ASCII	Reports RFID data in an ASCII format.

Communications (continued)

Menu Item	Details
PROCESS SOH (DATA)	Determines the way the printer responds to an Immediate Command (e.g., Get Status, Module Storage, etc.), where:
✧DISABLED	Processes commands normally.
ENABLED	Interrupts operations upon SOH receipt to process the command.

4.2.7 Diagnostics

The Diagnostics menu contains testing functions:

Menu Item	Details
HEX DUMP MODE	Allows raw code received from the host to print, where:
✧DISABLED	Executes commands and prints label formats normally.
ENABLED	Prints received data without processing; see Section 6.2.
OPTIONS TESTING	Allows testing of printer options, where:
TEST PRESENT SENSOR	Tests the Present Sensor (and Peel & Present Mechanism) on demand function, where:
LABEL NOT PRESENTED	Is displayed when the sensor is clear, and then LABEL PRESENTED when blocked.
TEST CUTTER	Tests the Cutter, where:
PERFORM TEST 1 TIME	Selects the number of cuts (1, 10, or 100) to perform, and then displays the PASS and FAIL results.

Menu Item	Details
TEST GPIO	Tests the General Purpose Input Output interface, where:
MONITOR GPIO INPUT	Displays the logic values for Start of Print (SOP), Feed, Pause, and Reprint (REPRT) signal inputs. (The values given below are examples only.) SOP 0 FEED 0 PAUSE 0 REPRT 0 ☑ ***Note:*** *Unconnected lines may assume a zero or one.*
MONITOR GPIO OUTPUT	Allows toggling and displays the logic values for End of Print (EP), Ribbon Low (RL), Service Required (SR), Media Out (MO), Ribbon Out (RO), Data Ready (DR), and Output Fault (OF) signal outputs. (The values given below are examples only.) EP 1 RL 1 SR 0 MO 1 RO 1 DR 0 OF 0 ☑ ***Note:*** *To change an output signal, cursor over the displayed state to select and then toggle it, except Data Ready which cannot be toggled.*
LOOPBACK	Not Supported
PRINT SIGNAL INFO	Prints signal names, pin assignments, settings, and current states for reference. **GPIO SIGNAL INFO** WED 11:04AM 24MAR2003 CARD ID#1 **OUTPUT SIGNALS** END OF PRINT PIN# 6 LOW PULSE CURRENT LEVEL 1 RIBBON LOW PIN# 5 ACTIVE LOW CURRENT LEVEL 1 SERVICE REQUIRED PIN# 4 ACTIVE LOW CURRENT LEVEL 0 MEDIA OUT PIN# 3 ACTIVE LOW CURRENT LEVEL 1 RIBBON OUT PIN# 2 ACTIVE LOW CURRENT LEVEL 1 **INPUT SIGNALS** START OF PRINT PIN# 8 ACTIVE HIGH CURRENT LEVEL 0 BACKUP LABEL PIN# 7 DISABLED CURRENT LEVEL 0

Diagnostics (continued)

Menu Item	Details
TEST SCANNER	Tests the Linear Scanner, where:
ALIGNMENT TEST	Reads a bar code then displays the decoded data, the code type and scan count, repeating.
SCAN TEST	Reads a bar code then displays the decoded data, the code type and scan count, non-repeating.
TEST RFID	Tests RFID, where:
TAG DATA	Reads the data encoded on the RFID chip.
DEVICE VERSION	Displays the type and version of the encoding device.
TAG ID – HF ONLY	Reads and displays the High Frequency Tag ID number.
PRINT TEST RATE (min)	Allows a label-to-label delay (0 - 120 minutes) when printing test label batches, where:
✧000 (0 - 120)	Is the selected delay interval, in minutes.
SENSOR READINGS	Displays A-D sensor values (0 – 255), where:
THR TRAN RIBM 24V → 127 159 093 175	Are the readings from the following sensors: • THR = Printhead thermistor sensor; • TRAN = Media sensor when set to Gap or Continuous, or REFL when to Reflective; • RIBM = Ribbon sensor; • 24V = 24 VDC sensor; • PS = Present sensor; • HD = Printhead position sensor; and, • RANK = Printhead ranking resistor. ☑ ***Note:*** *Readings provided here are examples only.*
← PS HD RANK 000 254 000	
RIBBON SENSOR LIMITS	Displays the values from the ribbon sensor (when equipped with the thermal transfer option), where:
RIBBON ADC LOW HIGH 070 104	Are the sensor readings (actual values will vary).

4.2.8 MCL Options

The MCL (Macro Command Language) Options menu contains alternate operating selections:

Menu Item	Details
MCL OPTIONS	Allows the printer to use the optional MCL (Macro Command Language) tool suite to accept peripheral device input data, where:
MCL AT POWER-UP	Allows MCL operation to begin when the printer is turned ON, where:
✧DISABLED	MCL operation does not occur; the printer uses standard DPL functions.
MCL LINK MODE	Starts MCL in Link Mode.
MCL PROGRAM MODE	Starts MCL in Program Mode.
START MCL	Starts MCL after exiting the menu.

☑ **Note:** *MCL is a custom application developed by an MCL Certified provider. Consult your provider for details regarding operation and support.*

4.3 The Test Menu

The TEST Key accesses six resident format selections that are printed at selected heat and speed settings (see Section 4.1.4 for printing details).

☑ **Notes:** *(1) With the exception of the Configuration Label, all test labels require full width media to capture the entire format.*

(2) During a test, press the ESC *Key or the* TEST *Key to stop printing.*

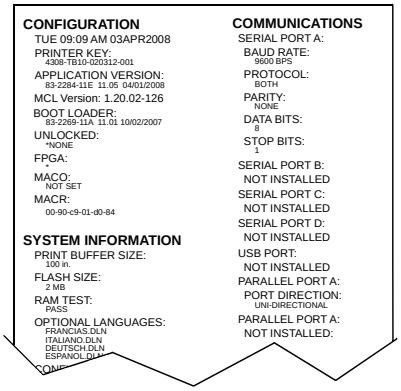
(3) Use PRINT TEST RATE (Section 4.2.7) to delay printing.

4.3.1 Print Quality Label

The Print Quality Label can be used to ensure conformance and visual aesthetics.

4.3.2 Configuration Label

The Configuration Label provides database information, as detailed in Section 4.2.



☑ Notes:

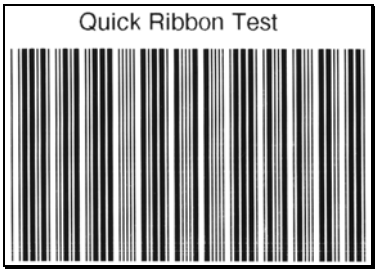
(1) Label contents vary with the application version, model, and options.

(2) Use at least 2 inch (51mm) wide media and set the Label Width accordingly (see Section 4.2.2).

(3) Bulleted items indicate host changes not yet saved.

4.3.3 Ribbon Test Label

The Quick Ribbon Test Label can be used to verify thermal transfer functions.



4.3.4 Validation Label

The Validation Label can be used to verify print quality.

4.3.5 Print Last Label

The Print Last Label function reprints the most recent test label, format received from the host, or format recalled from a memory module.

☑ **Note:**	*If a job was cancelled or if power was removed since the last job and the request for this label, no reprint will occur.*

4.3.6 User Defined Label

The User-Defined Label allows a template to be populated by variable data (via the printer's control panel or a USB QWERTY keyboard). The template is a stored label format, where fields delimited by the "&" become variable. The printer will prompt the user to enter these variable field data. (For example, the stored label format could contain the data 19131423443&ENTER NAME. Afterward, when recalled from memory, the printer's display will indicate the variable field: ENTER NAME.)

☑ **Notes:**	*(1) Variable data can be any part of the DPL format - font ID, rotation, positioning, etc.* *(2) No error checking will be performed.*

5 Operating, Adjusting and Maintaining the Printer

5.1 Displayed Messages

During operation the printer (when not in Menu or Test Mode) displays several types of information:

- Prompts and Condition Messages (see Section 5.1.1); and,
- Fault and Warning Messages (see Section 6.1.2).

5.1.1 Prompts and Condition Messages

Prompts are alerts to required actions, while Condition Messages are indicators of an operational state.

Prompts and Condition Messages		
Displayed Message	**Description**	**Action**
ACCESS DENIED	The password used to access the secured menu was incorrect.	Enter the correct password.
CALIBRATION COMPLETE	The FEED Key was pressed and held.	Allow the calibration to complete.
CANCEL BATCH ENTER KEY = YES	The CANCEL or TEST Key was pressed during a multiple label job.	Press ENTER to cancel all remaining labels in the job.
CANCEL REPRINT? ENTER KEY = YES	The CANCEL or TEST Key was pressed during a fault. (See FAULT HANDLING / VOID AND RETRY, Section 4.2.5.)	Press ENTER to cancel the reprint.
CLEARING FAULTS	The FEED Key was pressed following a fault and now the printer is attempting to clear the condition.	No action is required.

Prompts and Condition Messages *(continued)*		
Displayed Message	**Description**	**Action**
DISPLAY CONTRAST	The MENU Key is being pressed and held, and now the LCD contrast is being adjusted.	Release the MENU Key when the desired contrast is achieved.
DMXNET INITIALIZING	The network card is initializing, a normal condition following power-up or a reset.	No action is required. Depending upon the settings, it may take a few minutes.
NOT INSTALLED	The selected option or feature cannot be found.	Verify that the option or feature is correctly installed. If so, call for service.
PAUSED	The PAUSE Key was pressed (or PAUSE MODE is enabled, see Section 4.2.5) and now the printer is in a paused condition.	Press PAUSE.
PRINTHEAD CLEANING	The TEST Key was pressed and held, or CLEAN HEAD NOW was selected, and now printhead cleaning is in progress.	No action is required.
READY	The printer is waiting to receive label formats, downloads, etc.	Send a label format, download, etc.
REMOVE LABEL	The Present Sensor (or Peel and Present Mechanism) is enabled and a label awaits removal.	Remove the label.
REMOVE RIBBON PRESS ANY KEY	The TEST Key was pressed and held, or CLEAN HEAD NOW was selected, but ribbon is installed.	Remove ribbon and press any key to proceed.
SUCCESSFUL PRESS ANY KEY	The selected operation was successfully completed.	Press any key to continue.

Prompts and Condition Messages *(continued)*		
Displayed Message	**Description**	**Action**
SYSTEM INITIALIZING	The power switch has been turned ON or a reset has occurred.	No action is required. Wait briefly while the process completes.
SYSTEM RESET IN PROGRESS	A reset has occurred.	No action is required. Wait briefly while the process completes.
UNCALIBRATED	The Media Sensor is not calibrated.	Perform calibration; see Section 5.2.
WAITING FOR DATA	The GPIO Start of Print signal has been received, but the printer awaits label data.	Send data from the host.
WAITING FOR SIGNAL	The printer awaits a Start of Print signal.	Send the GPIO Start of Print signal from the host.
XXXX OF XXXX PRINTING	A print job is in process, as indicated by the batch total and remaining label count.	No action is required.

5.2 Calibration

Calibration ensures label detection. Perform calibration when the UNCALIBRATED is displayed. Two different methods, Standard and Advanced Entry, are available to calibrate the printer.

5.2.1 Standard Calibration

Standard Calibration, appropriate for most media types, is a method that allows visual access to the media sensor for positioning. Displayed sensor readings can also be used to indicate the best position over the media – helpful when using small, position-critical TOF notches or marks.

Three samples are required:

- Empty: Nothing in the sensor.
- Gap (or Mark): The media liner, notch, or reflective mark in the sensor.
- Paper: The label (and liner, if any) in the sensor.

With the correct SENSOR TYPE selected (see Section 4.2.2), perform a Standard Calibration as follows:

Step	Action	Displayed Message	Comment
1	Turn ON the printer.	UNCALIBRATED	Wait briefly, about six seconds, for the printer to initialize.
2	Press the MENU Key, and then raise the printhead assembly.	MENU MODE MEDIA SETTINGS	You are in MENU MODE.
3	Press the ENT Key.	MEDIA SETTINGS MEDIA TYPE	You are in MEDIA SETTINGS.
4	Press the FWD Key then scroll to SENSOR CALIBRATION.	MEDIA SETTINGS SENSOR CALIBRATION	Press the ESC Key to cancel this procedure.
5	Press the ENT Key.	SENSOR CALIBRATION PERFORM CALIBRATION	You are beginning the procedure.
6	Press the ENT Key, and then press any key.	REMOVE LABEL STOCK PRESS ANY KEY <yyy>	No media should be in the sensor. This sets the Empty value, where “yyy” is the current sensor reading.

Standard Calibration (continued)

Step	Action	Displayed Message	Comment
7	Proceed according to your media: • Die-cut – remove a label from the backing material then place the backing in the sensor. Adjust the Sensor Eye Mark over the center of the backing. • Notched – load media in the printer then adjust the Sensor Eye Mark over the center of the notch. • Reflective – load media in the printer (black mark facedown) then adjust the Sensor Eye Mark over the center of the black mark. • Continuous – go to Step 8. Press any key to continue.	SCAN BACKING PRESS ANY KEY <yyy> *Or, for reflective media:* SCAN MARK PRESS ANY KEY <yyy>	See Section 3.3 for sensor positioning details. This sets the backing, gap, or mark value where "yyy" is the current sensor reading. ☑ ***Note:*** *Never position the sensor over a perforation when sampling.*

☑ ***Note:*** *Do not move the Media Sensor after it has been positioned.*

Step	Action	Displayed Message	Comment
8	Position the media (and backing, if any) under the sensor then press any key to continue.	SCAN PAPER PRESS ANY KEY <yyy>	This sets the paper value, where "yyy" is the current sensor reading. ☑ ***Note:*** *If using preprinted media, ensure the label area under the Sensor Eye Mark is free of text, graphics, or borders.*

Standard Calibration (continued)

Step	Action	Displayed Message	Comment
9	Observe the LCD.	GAP MODE CALIBRATION COMPLETE *Or, for reflective media:* REFLECTIVE MODE CALIBRATION COMPLETE *Or, for continuous media:* CONTINUOUS MODE CALIBRATION COMPLETE	The calibration was successful if CALIBRATION COMPLETE appears. (If, however, another message was displayed see Note 1, below.)
10	Press the ESC Key three times to exit the menu. Users of circular or irregularly shaped die-cut media see Note 2 before proceeding. If using gap, notch or reflective media, press and hold the FEED Key. Allow at least one label to advance from the printer before releasing the key.	READY	The printer is ready. If this calibration was unsuccessful, go to Section 5.2.2. ☑ ***Notes:*** *(1) WARNING LOW BACKING is a normal message when calibrating notched media or media with transparent backing; see Section 6.1.2 for other possible messages.* *(2) If using circular or irregularly shaped die-cut labels, reposition the Sensor Eye Mark over the widest part of a label.*

5.2.2 Advanced Entry Calibration

Advanced Entry is the alternate calibration method for special-case media types. In the procedure, sensor readings for the label and TOF values are taken using different sampling algorithms. From this compiled list of values the best algorithm is selected and then used to generate new readings for manual entry into memory.

> ☞ *Advanced Entry Calibration overrides all previous calibration settings and should be used only when Standard Calibration proves unsuccessful.*

With the correct SENSOR TYPE selected (see Section 4.2.2), perform an Advanced Entry Calibration as follows:

Step	Action	Displayed Message	Comment
1	Turn ON the printer.	UNCALIBRATED	Wait briefly, about six seconds, for the printer to initialize.
2	Press the MENU Key, and then raise the printhead assembly.	MENU MODE MEDIA SETTINGS	You are in MENU MODE.
3	Press the ENT Key.	MEDIA SETTINGS MEDIA TYPE	You are in MEDIA SETTINGS.
4	Press the FWD Key then scroll to SENSOR CALIBRATION.	MEDIA SETTINGS SENSOR CALIBRATION	Press the ESC Key to cancel this procedure.
5	Press the ENT Key, and then the FWD Key.	SENSOR CALIBRATION ADVANCED ENTRY	Press the ESC Key to cancel this procedure.
6	Press the ENT Key, and then the FWD Key.	ADVANCED ENTRY SENSOR GAIN	You are beginning the procedure.

Advanced Entry Calibration (continued)

Step	Action	Displayed Message	Comment
7	Press the ENT Key. Place the label under the Sensor Eye Mark, and then lower the printhead assembly.	GAIN TRAN <yyy> *00 <0 - 31> *Or, for reflective media:* GAIN REFL <yyy> *00 <0 - 31>	See Section 3.3 for sensor positioning details. If using preprinted media, ensure the label area under the Sensor Eye Mark is free of text, graphics, or borders.
8	Use the FWD Key to scroll to the 00 GAIN setting and then press the ENT Key. Record the sensor reading as a **Label Value** in a table similar to the one shown below.	GAIN TRAN <yyy> *00 <0 - 31> *Or, for reflective media:* GAIN REFL <yyy> *00 <0 - 31>	Selection is denoted by an asterisk (*). The sensor reading equals the "yyy" value. ☑ ***Note:*** *Never position the sensor over a perforation when sampling.*

Sampling Table

Gain Number	Label Value	TOF Value	Difference Value
00	255		
01			
02			
...			
31			

Step	Action	Displayed Message	Comment
9	Press the FWD Key to increment the Gain Number then press the ENT Key and record the resulting Label Value. Repeat this step for each of the remaining Gain Numbers (01-31).	GAIN TRAN <yyy> *31 <0 - 31> *Or, for reflective media:* GAIN REFL <yyy> *31 <0 - 31>	

Advanced Entry Calibration (continued)

Step	Action	Displayed Message	Comment
10	Proceed according to your media type: • Die-cut – remove a label from the backing material then place the backing into the sensor. Adjust the Sensor Eye Mark over the center of the backing. • Notched – adjust the Sensor Eye Mark over the center of the notch. • Reflective – adjust the Sensor Eye Mark over the center of the facedown black mark. Use the FWD Key to scroll to the 00 GAIN setting and then press the ENT Key. Record the sensor reading as a **TOF Value.**	GAIN TRAN <yyy> *00 <0 - 31> *Or, for reflective media:* GAIN REFL <yyy> *00 <0 - 31>	☑ ***Note:*** *Never position the sensor over a perforation when sampling.*

☑ ***Note:*** *Do NOT move the Media Sensor after it has been positioned.*

Sampling Table

Gain Number	Label Value	TOF Value	Difference Value
00	255	254	
01	251		
02	241		
...	...		
31	112		

Step	Action	Displayed Message	Comment
11	Press the FWD Key to increment the Gain Number then press the ENT Key and record the resulting TOF Value. Repeat this step for each of the remaining Gain Numbers (01-31).	GAIN TRAN <yyy> *31 <0 - 31> *Or, for reflective media:* GAIN REFL <yyy> *31 <0 - 31>	
12	From the collected data, where both the values are above 20, subtract the Label Value from the corresponding TOF Value to find the **Difference Value**. Note the Gain Number of the largest Difference Value.	GAIN TRAN <yyy> *31 <0 - 31> *Or, for reflective media:* GAIN REFL <yyy> *31 <0 - 31>	For example in the table below, Gain Number 08 is chosen because it has the highest Difference Value (146) where both the Label and the TOF Values are above 20.

Sampling Table

Gain Number	Label Value	TOF Value	Difference Value
00	255	254	1
01	251	240	11
02	241	213	28
03	231	182	49
04	219	150	69
05	212	119	93
06	200	88	112
07	189	58	131
08	178	32	146
09	167	19	N/A
10	156	17	N/A
...	...	...	...
31	116	14	N/A

Step	Action	Displayed Message	Comment
13	Using the FWD Key, scroll to the Gain Number determined in Step 12, and then press the ENT Key.	GAIN TRAN <yyy> *08 <0 - 31> *Or, for reflective media:* GAIN REFL <yyy> *08 <0 - 31>	

Advanced Entry Calibration (continued)

Step	Action	Displayed Message	Comment
14	*a)* Place the media in the sensor. Record the reading and label it “P” (paper). *b)* Place the backing, notch, or mark in the sensor. Record the reading and label it “G” or “M” (Gap or Mark). *c)* Remove media. Record the reading and label it “E” (Empty).	GAIN TRAN <yyy> *08 <0 - 31> *Or, for reflective media:* GAIN REFL <yyy> *08 <0 - 31>	The samplings using the selected Gain Number are taken.
15	Press the ESC Key, and then press the FWD Key.	ADVANCED ENTRY SENSOR LEVELS	The sensor readings must be entered into the printer.
16	Press the ENT Key. Using the FWD Key or the REV Key, set the Paper Sensor Level to the value determined in the previous step. Press the ENT Key to select the entry and advance the menu. Repeat for the Gap Sensor Level (or Mark Sensor Level) and the Empty Sensor Level entries.	PAPER SENSOR LEVEL P*198 G*084 E*014 ↓ GAP SENSOR LEVEL P*198 G*084 E*014 ↓ EMPTY SENSOR LEVEL P*198 G*084 E*014 *Or, for reflective media:* PAPER SENSOR LEVEL P*015 M*181 E*213 ↓ MARK SENSOR LEVEL P*015 M*181 E*213 ↓ EMPTY SENSOR LEVEL P*015 M*181 E*213	Selection is denoted by an asterisk (*). The displayed message will change and the selection will flash to indicate the next entry.

Advanced Entry Calibration (continued)

Step	Action	Displayed Message	Comment
17	After all entries have been made, press the ESC Key to back out of the menu and then press the ENT Key to save the settings and return to the Ready Mode.	SAVE CHANGES? ENTER KEY = YES	From READY, press the FEED Key to advance to the next label TOF.

☑ **Note:** *If the Advanced Entry Calibration fails, enter MEDIA SETTINGS / CALIBRATION / ADVANCED ENTRY / SENSOR GAIN and lower the selected Gain Number by one. Select the new Gain Number then save the changes and exit the menu. Retest your media. If unsuccessful, repeat the procedure until a usable gain is obtained.*

5.3 Reset Methods

There are three reset methods, each with a different affectivity. Proceed according to the desired result:

5.3.1 Soft Reset

To clear any temporary host settings, press and hold the CANCEL Key for approximately four seconds.

5.3.2 Level One Reset

To return the factory default settings or (if saved) a Factory Setting File, turn OFF the printer. Press and hold the PAUSE and CANCEL Keys while turning ON the printer and until the SYSTEM RESET message flashes.

☑ **Note:** *This is same as selecting SET FACTORY DEFAULTS; see Section 4.2.5.*

5.3.3 Level Two Reset

To return the firmware default settings and clear all parameters, turn OFF the printer. Press and hold the PAUSE, FEED, and CANCEL Keys while turning ON the printer and until the SYSTEM RESET message flashes.

☑ **Note:** *Calibration is required; see Section 5.2.*

5.4 Printhead Assembly Adjustments

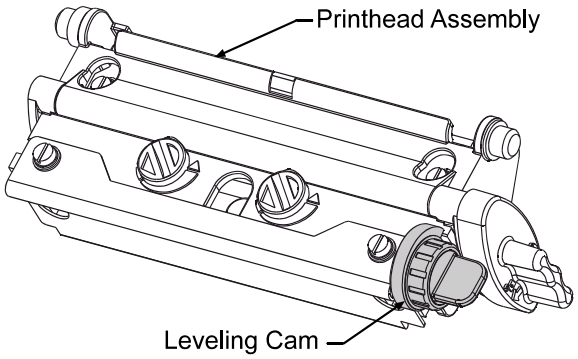
Mechanical adjustments ensure consistent print quality across a wide range of media types and sizes.

5.4.1 Leveling Cam Adjustment

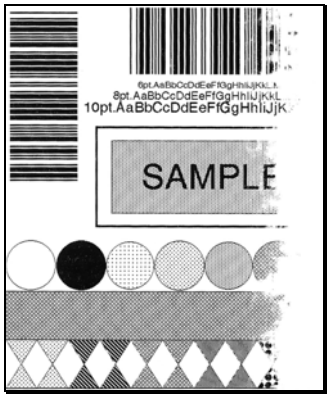
Use the Leveling Cam to adjust pressure distribution when printing on media that is less than four inches (102 mm) wide:

A. With media loaded, download a batch of labels (or use a test format) and begin printing.

B. While observing the printed labels, rotate the Leveling Cam counter-clockwise to an over-adjusted position (see Example 1).

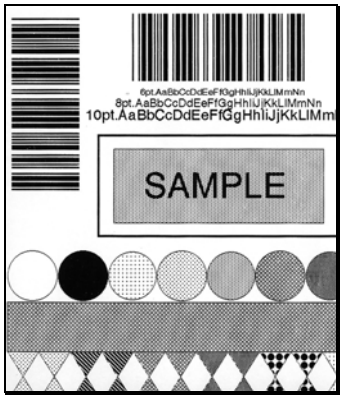


C. Rotate the Leveling Cam clockwise, one click at a time, until the printed labels contain a complete, even image (see Example 2).



Example 1 –

Too much adjustment produces an image that fades across the label.



Example 2 –

Correct adjustment produces a complete image, with even print contrast across the label.

☑ **Note:** *Under-adjustment can cause ribbon wrinkling, lateral label movement, and excessive wear on printer components.*

☞ *When changing to a different width of media, readjust the Leveling Cam.*

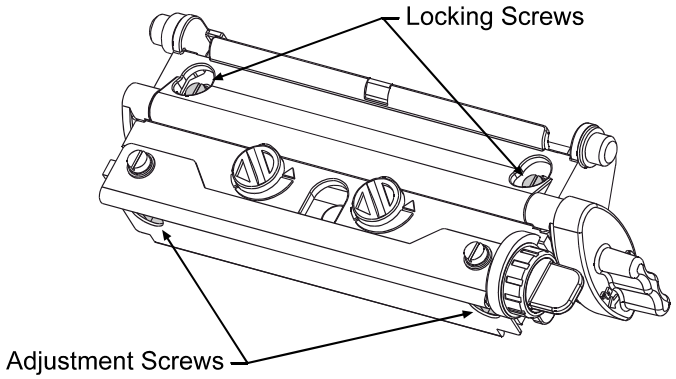
5.4.2 Burn Line Adjustment

Adjust the Burn Line only after trying the print quality improvement suggestions in Section 5.4.1 and 7.2.1. If print quality remains unacceptable, a Burn Line Adjustment may be necessary:

☞ *If you have questions regarding this procedure, contact a qualified technician or Datamax Technical Support for answers.*

A. Load the printer with your media (and ribbon, if required) then lower the printhead assembly and rotate the printhead latch into the locked position.

B. Loosen the two Locking Screws approximately ¼ turn counter-clockwise.



C. Equally turn each Adjustment Screw counter-clockwise until the burn line is positioned past the platen roller apex. Print a Validation Label; see Section 4.3.4. (The print on the label should have a light, uneven appearance.)

D. Tighten the Locking Screws just enough to remove any play in the printhead assembly, while leaving them loose enough to allow for adjustment.

E. Equally turn each Adjustment Screw clockwise about ¼ turn (or 1/8 turn for finer adjustments as print quality becomes maximized – see note below) then print a Validation Label and examine the print quality for improvement. Repeat this step until the labels are produced with even print contrast and acceptable print quality.

> ☑ **Note:** *Turning the Adjustment Screws counter-clockwise will NOT move the printhead outward; if the printhead was adjusted too far inward, restart the entire procedure.*

F. Tighten the Locking Screws. Print a final test label to verify the adjustment.

5.5 Printhead Replacement

CAUTION

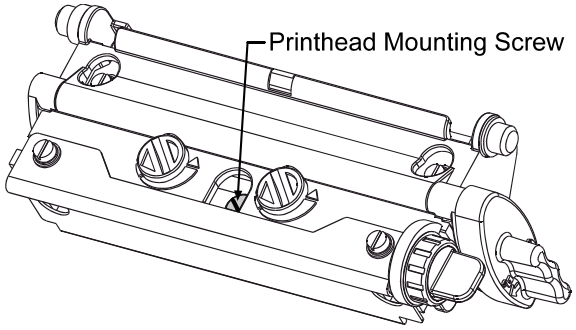
- Use extreme care when handling the printhead and follow standard ESD prevention procedures.
- Never use sharp objects on the printhead surface.
- If 24V OUT OF TOLERANCE is displayed (see Section 6.1.2), or if you have any questions regarding this procedure, contact a qualified technician or Datamax Technical Support for answers.

Follow the procedure below to replace the printhead:

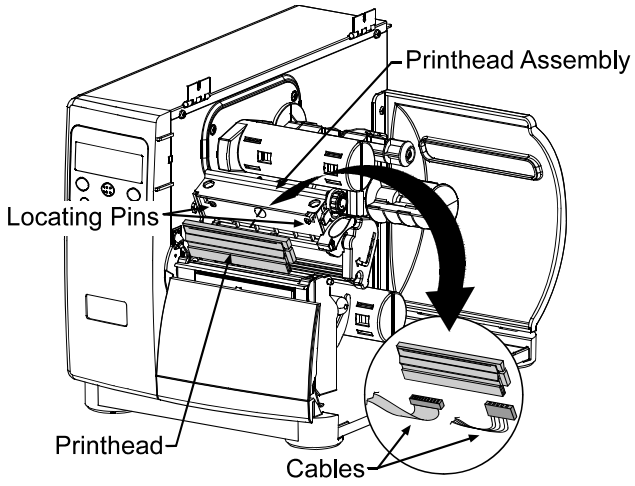
A. Touch a bare metal area of the printer's frame to discharge any static electricity present on your body.

B. Turn OFF and unplug the printer. Open the access cover. If ribbon is installed, remove it.

C. With the printhead locked in the down position, loosen the Printhead Mounting Screw (it will remain in the assembly).



D. Rotate the printhead latch forward and, while supporting the Printhead, raise the Printhead Assembly. Disconnect the Cables and then remove the Printhead.



E. Install the Printhead by securely connecting both Cables.

F. Position the Printhead onto the Locating Pins in the Printhead Assembly and secure it with the Printhead Mounting Screw. (Do not over-tighten the screw.)

☑ **Note:** *Printhead alignment is normally not required.*

G. Clean the Printhead; see Section 5.6.1.

H. If removed, load ribbon. Lower the printhead assembly, and rotate the printhead latch into the locked position. Plug in and turn ON the printer. Print a Validation Label (see Section 4.3.4). If necessary, adjust the PRINT CONTROL / CUSTOM ADJUSTMENTS / DARKNESS setting (see Section 4.2.3) so that the print contrast matches previous levels.

5.6 Maintenance

The following list and table detail the recommended items, techniques, and schedules to help you safely and effectively maintain the printer:

- Isopropyl alcohol
- Cotton swabs
- A clean, lint-free cloth
- Soft-bristle brush
- Soapy water/mild detergent
- Compressed air
- Printhead Cleaning Cards or Printhead Cleaning Film

CAUTION For your safety and to avoid damage, always turn OFF and unplug the printer before cleaning. Also, take proper precautions when using isopropyl alcohol – a flammable liquid.

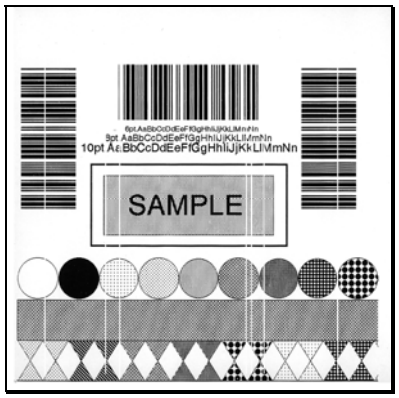
Recommended Cleaning Schedule*		
Area / Item(s)	**Interval****	**Method / Supplies**
Printhead	Thermal transfer media – after each roll of ribbon; and, Direct thermal media – after each roll of media, or as needed.	Isopropyl alcohol; and, if necessary, Printhead Cleaning Cards or Printhead Cleaning Film (see Section 5.6.1).
Rollers	After each roll of labels, after each roll of ribbon, or as needed.	Cotton swab dampened with isopropyl alcohol (see Section 5.6.2).
Media Path & Media Sensor	As needed, based on a weekly visual inspection.	Compressed air or a soft brush. Isopropyl alcohol, as needed.
Exterior Surfaces	As needed.	Mild detergent (see Section 5.6.3).
Interior Surfaces	As needed.	Soft-brush or compressed air. Remove all buildup. See Section 5.6.3.

**For optional equipment, refer to the documentation that accompanied the item(s).*
***Whichever interval comes first.*

5.6.1 Cleaning the Printhead

CAUTION NEVER use a sharp object to clean the Printhead.

If print quality declines (see example below) the typical cause can be traced to debris buildup on the printhead, which over time can lead to element failure, greatly reducing the service life of the printhead.

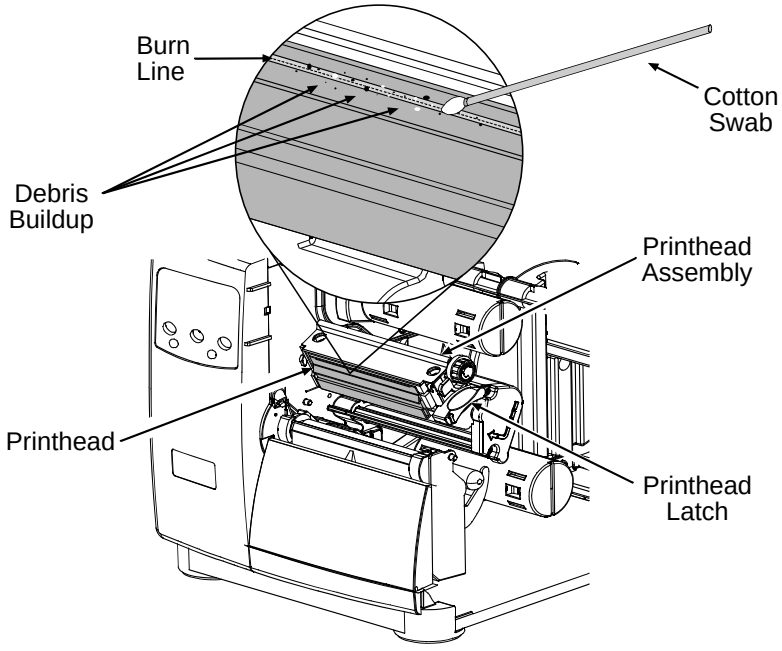


Faulty Label Example –

Streaks in the direction of print indicate a dirty or faulty printhead. (To print a test label, see Section 4.3.)

To clean the printhead use the CLEAN HEAD NOW selection (see Section 4.2.2). For excessive or hard to remove buildup use cleaning cards, cleaning film, or perform the following procedure:

A. Turn OFF and unplug the printer. Open the access cover. Unlock the Printhead Latch and raise the Printhead Assembly. **Allow the printhead to cool before proceeding.**



B. Move media and ribbon away from the printhead, as necessary.

C. Using a cotton swab moistened (never soaked) with isopropyl alcohol, gently wipe away any buildup on the Printhead surface while paying special attention to cleaning the Burn Line. **Allow the printhead to dry.**

D. Replace the ribbon and media. Lower the Printhead Assembly and rotate the Printhead Latch completely back, to the locked position.

E. Close the cover. Plug in and turn ON the printer. Feed several labels to normalize tracking.

5.6.2 Cleaning the Platen Roller

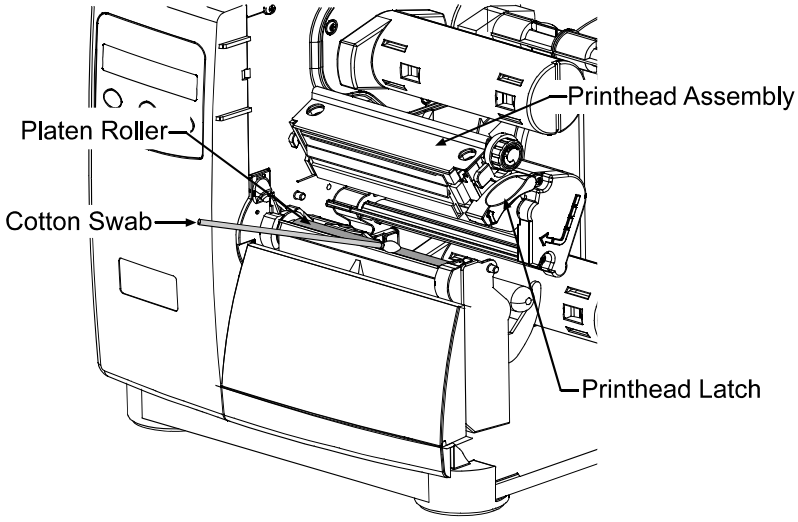
CAUTION NEVER use a sharp object to clean the Platen.

Grit, adhesive, and ink buildup can cause a decline in print quality and, in extreme cases, cause labels to stick and wrap around the roller. Clean the platen roller as follows:

A. Turn OFF and unplug the printer.

B. Open the access cover. Unlock the Printhead Latch and raise the Printhead Assembly. Remove media and ribbon.

C. Using a Cotton Swab dampened with isopropyl alcohol clean the accessible portion of the roller, and then manually rotate the roller to clean the remaining area. Allow the roller to dry.



D. Replace ribbon and media.

E. Lower the Printhead Assembly and rotate the Printhead Latch completely back, to the locked position.

F. Close the access cover. Plug in and turn ON the printer. Feed several labels to normalize tracking.

5.6.3 Cleaning Interior and Exterior Surfaces

Interior Surfaces – Turn OFF and unplug the printer. Remove all media. Then, using a soft bristle brush or compressed air, remove all dust particle buildup inside the printer.

Exterior Surfaces – Turn OFF and unplug the printer. Remove all media. Then, using a soft cloth or sponge dampened with general-purpose cleanser (never abrasive cleansers or solvents) wipe the exterior surfaces until clean.

5.7 Application Updates

As available, application program (firmware) updates can be found on our web site at http://www.datamaxcorp.com and then installed in the printer.

The update can be performed in Ready Mode or in Download Mode. Before updating, identify the current program version by printing a Configuration Label (see Section 4.2.2). Compare that version string to those available from our web site then download the desired file onto your computer's hard drive. Proceed according to the currently installed version:

- If 2.091 or greater, see Section 5.7.1 or 5.7.2.
- If 2.08 or less, see Section 5.7.2.

☑ Notes: *If updating to version 11.021 or greater, the Boot Loader must be updated before proceeding; see Section 5.8.*

Also, those desiring an alternate menu language must also download the EFIGS menu language file. Go to the EFIGS directory and copy 832296.01C (or most current version) to lpt1: /b (where the DOS Copy command requires the /b parameter because this file contains binary code).

WARNING If an error occurs during downloading, the update will be terminated. If the process did not reach ERASING FLASH or UPDATING SOFTWARE, the previous program will remain intact; otherwise, a successful download must be completed to make the printer operable.

5.7.1 Updating from Ready Mode

Application Version 2.091 (or greater) Update Procedure			
Step	**Displayed Message**	**Action**	**Comment(s)**
1	READY	Using the DOS copy command (where "filename" is the program to be loaded and "lpt1" is the selected interface port), enter the following: `copy filename lpt1:`	As an example, this would be entered as: `copy i4212_1105.zg lpt1` (Where "lpt1" can differ to include another port, as equipped.) The Ready Indicator will flash as data is received.
2	UPGRADING SOFTWARE	No action required.	The new application is being stored and verified.
3	4214 11.04 03/26/2008	No action required.	The printer has reset and is displaying the new firmware version.
4	READY	No action required.	The new application is running. ☑ ***Note:*** *If UNCALIBRATED is displayed, see Section 5.2.*

5.7.2 Updating from Download Mode

Application Version 2.08 (or less) Update Procedure*			
Step	**Displayed Message**	**Action**	**Comment(s)**
1	BOOT–PA10 02.08 2/11/00	Turn OFF the printer. Press and hold the PAUSE Key and TEST Key while turning ON the printer.	The Boot Loader version is displayed. ☑ ***Note:*** *This information will vary with the printer model and Boot Loader version.*
2	UPDATE SOFTWARE SEND SOFTWARE	Using the DOS copy command, copy the filename to the printer (see Section 5.7.1 for an example).	The printer is ready to accept the new application version. ☑ ***Note:*** *The parallel port (LPT1) must be used to write to the printer.*
3	UPDATE SOFTWARE READING IMAGE	No action required.	The printer is receiving the new program.
4	ERASING FLASH SOFTWARE IMAGE	No action required.	Received and verified, memory is now being cleared of the previous program.
5	WRITING FLASH SOFTWARE IMAGE	No action required.	The new program is being written into Flash memory. Upon completion and after a printer invoked reset, the new application will run. ☑ ***Note:*** *If UNCALIBRATED is displayed, see Section 5.2.*

**This can also be used as an alternate method to download all other versions.*

5.7.3 Possible Problems

The following is list of possible error messages when downloading updates:

Application Update Error Messages	
Displayed Message	**Descriptions / Causes / Solutions**
DECOMPRESSION ERROR	The printer detected an error during the decompression and transfer of file data from cache storage into the Flash memory. Confirm the version and retry in Download Mode; however, if the problem continues call for service.
ERROR ERASING FLASH	The printer could not successfully erase Flash memory. The possible cause is defective Flash memory. Try the download again; however, if the problem continues call for service.
ERROR WRITING FLASH	The printer could not successfully write the program into Flash memory. A possible cause is defective Flash memory. Try the download again; however, if the problem continues call for service.
HARDWARE MISMATCH DATA REJECTED	Application downloaded was not compatible with the main logic card. The firmware used was for a different class model and not supported by this Boot Loader version (see CONFIGURATION LEVEL / PRINTER KEY, Section 4.2.5).
INVALID SOFTWARE DATA REJECTED	The printer detected an error. The possible causes include: • An invalid or corrupted file was downloading – try saving the file to the host and then download again. • A communications error occurred – recheck cabling and port setting.
SOFTWARE MISMATCH DATA REJECTED	Software level not authorized for this printer (see CONFIGURATION LEVEL / PRINTER KEY, Section 4.2.5).

☑ **Notes:** *If experiencing trouble when attempting to download the file to the printer, try the following alternate methods:*

1) Use the Download Mode (see Section 5.7.2).

2) Windows® users – try restarting the computer in MS-DOS mode.

3) Use the Datamax Driver by Seagull Scientific™ – Device Setting / Send File to Printer function.

5.8 Boot Loader Updates

The printer stores its Boot Loader program in Flash memory on the main logic card. As available, updates can be found on our web site at ftp://ftp.datamaxcorp.com and then installed in the printer.

WARNING If power is lost while UPGRADING SOFTWARE is displayed, the printer will become non-functional and will require factory programming or a main logic card.

Before updating, identify the current program version by printing a Configuration Label (see Section 4.3.2). Compare that version string to those available from our web site then download the desired file onto your computer's hard drive. Follow the steps below to update the version:

Boot Loader Update Procedure			
Step	**Displayed Message**	**Action**	**Comment(s)**
1	READY	Using the DOS copy command (where "filename" is the program to be loaded and "lpt1" is the selected interface port), enter the following: `copy filename lpt1:`	As an example, this would be entered as: `copy boottb_0304.bs lpt1` (Where "lpt1" can differ to include another port, as equipped.) The Ready Indicator will flash as data is received.
2	UPGRADING SOFTWARE	No action required.	The new program is being stored and verified.
3	4212 3.04 07/26/2000	No action required.	The printer has reset automatically.
4	READY	No action required.	The new application is now running. ☑ ***Note:*** *If UNCALIBRATED is displayed, see Section 5.2.*

☑ ***Note:*** *If the update failed, press and hold the PAUSE and TEST Keys (see Section 4.1) while turning ON the printer. After SEND SOFTWARE is displayed, release the keys then re-send the file as described above.*

6 Troubleshooting

6.1 Problem Resolution

When a problem is encountered, the information in this section will help resolve it. Locate the description of the problem to find an appropriate solution. For problems that are accompanied by a displayed message, see Section 6.1.2.

> ☞ *If you have questions, or if problems persist, contact a qualified technician or Datamax Technical Support.*

6.1.1 General Resolutions

The following table lists problems that may not be accompanied by a displayed message:

If experiencing this problem…	Try this solution…
Cannot communicate through the parallel port:	Send a format to the printer then observe the Ready Indicator – If the indicator does not flash, check the parallel cable type; also check the protocol and port settings of the printer and host.
Cannot load media through the cutter:	⚠ **WARNING!** Use extreme care. Turn OFF and unplug the printer before proceeding. Ensure the cutter and its cable are properly installed and connected to the printer – Plug in and turn ON the printer. You should hear the blade cycle; otherwise, call for service.

General Resolutions (continued)

If experiencing this problem…	Try this solution…
Erratic media movement:	The printer may require a calibration – See Section 3.5.
Erratic printing (instead of the label format, strange characters are printed):	• The printer may be in Hex Dump Mode – See Section 6.2. • If using the serial communication the port settings may be incorrect – Check both the host and printer port data bit settings.
Intellifont™ will not print:	You may be using an incorrect type – Intellifont™ format is Little/Big Endian specific and the printer uses Big Endian; refer to your font supplier for information.
Light print on the right side of the label (as it exits the printer):	• The Printhead Leveling Cam may be incorrectly adjusted – See Section 5.4.1 for adjustment details. • The platen may be dirty (or worn) – See Section 5.6.2 for cleaning details, and check wear by visual inspection.
Missing printed information:	• Check the label format for character placement outside the dimensions of the label – All row / column values must allow enough space for the height and length of the information to be printed. • The available memory may have been exceeded by the format size – Try reducing the memory allocated to either the internal module or scaleable font cache; see Section 4.2.5. • If using serial communication, ensure that the interface cable meets the pin out requirements – See Section 7.3.
Missing print on left or right side of the label:	Information may be formatted outside the label dimensions – Check your software program label size or check the values in PRINT CONTROL / COLUMN OFFSET and / CUSTOM ADJUSTMENTS / COLUMN OFFSET; Section 4.2.3.

General Resolutions (continued)

If experiencing this problem…	Try this solution…
The LCD is off, but indicator lights are illuminated:	The Display Contrast may set too low – Press and hold the MENU Key; see Section 4.1.1.
The LCD is off and no indicator lights are illuminated:	• Verify that the AC power cord is connected to the outlet and the printer, and that the power switch is ON. • Verify that the AC outlet is functioning, or try moving the printer to another location with a different AC circuit. • The AC cord may be damaged, if so replace it. • The line fuse may be blown, if so call for service.
No print (labels advance normally but are blank):	Examine the used ribbon for an image – *If an image is present, then:* • Verify that the ribbon was properly loaded per Section 3.4. • If properly loaded – then the wrong coating configuration is being used. (To verify the inked side, press the adhesive backing of a label against the ribbon surface – ink will only lift from the coated side.) Clean the printhead (see Section 5.6.1) and replace the ribbon with a correct type; see Section 3.4. *If no image is present, then:* • Print any test label (see Section 4.3) – If an image printed then check the protocol and port settings for both the printer and host; these must match. • The heat setting may be too low. Make an adjustment in the software program or through the menu. (Same function commands from the host computer can override the menu settings; see Section 4.2.6.) • The media/ribbon combination may be incorrect – See Section 7.2.2. • The printhead or printhead cable(s) may be loose – **Power OFF the printer before reconnection** – see Section 5.5 for locations.

General Resolutions (continued)

If experiencing this problem…	Try this solution…
Nothing happens when printing from your software program:	• Ensure that the printer is at READY. • Observe the Ready Indicator – If the indicator does not flash when sent, check the printer and host protocol and port settings. • Ensure the interface cable meets the requirements found in Section 3.1.1.
Poor print quality:	• The printhead may need cleaning – See Section 5.6.1. • Adjust the Heat and Print Speed settings through the Front Panel or by host commands – See Section 4.2.3. (Also, the same functional commands from the host computer can override menu settings – See Section 4.2.6.) • The media/ribbon combination may not be compatible – See Section 7.2.2. • The Printhead Leveling Cam may be incorrectly adjusted – See Section 5.4.1. • The Platen Roller may be dirty or worn – See Section 5.6.2. • The Printhead Burn Line may need adjusting – See Section 5.4.2.
Skips labels when printing:	• Calibration may be needed – See Section 3.5. • The Media Sensor may be out of position – Readjust the position; see Section 3.3. • The format may be within 1/8 inch of the label's edge – Try reducing or moving the format slightly.
Unable to print rotated text:	The characters may be formatted outside the label dimensions – Ensure the row/column values provide enough room for the height of the characters or bar code to be printed. See the *Class Series 2 Programmer's Manual*.

6.1.2 Warning and Fault Messages

The printer displays messages when the possibility of a problem or an actual fault occurs. Depending upon the displayed message, find the possible action or solution in the tables below.

☑ **Note:** *Warning and Fault Messages do not appear in Menu or Test Mode.*

Warning Messages:

Displayed for about three seconds, Warning Messages assume a low priority and indicate a pending change in printer configuration, or an operating condition that could lead to a fault.

Warning Messages		
Displayed Message	**Description**	**Action(s)**
DOT FAILURE	The printer has detected defective printhead elements.	Replace the printhead if the print quality becomes unacceptable.
GAP MODE WARNING LOW BACKING	The printer measured only a small difference between the “empty” and “gap” sensor readings.	Transparent backing or notched media typically gives this indication, and a slight delay may occur for the “Out of Stock” indication; no action is required.
GOODBYE	Power has been removed and shutdown is in progress.	The power switch was turned OFF; a line fuse was blown; or, the line voltage was lost.
HEAD NEEDS CLEANING	The scheduled printhead cleaning distance has been reached.	Press and hold the TEST Key or select CLEAN HEAD NOW; see Section 5.4.1.
HOST CHANGES PENDING	The host has pending configuration changes that require a “host reset command.”	To save the changes send a host reset command (in DPL), or discard changes by performing a soft reset; see Section 5.3.1.

Warning Messages (continued)

Warning Messages		
Displayed Message	**Description**	**Action(s)**
LOW VOLTAGE	The printer has detected a low operating voltage.	• Possible low or fluctuating line voltage level – Try moving the printer to another AC outlet; if the condition persists, call for service. • If printing black over more than 50% of the total label area, try reducing the HEAT setting or the size of the black area.
RTC RAM FAILURE	The printer was unable to save settings in permanent memory.	Possible faulty main logic card. If the condition persists, call for service.
TEMPERATURE PAUSE	A high printhead temperature has been detected.	No action required. Printing will resume after the printhead cools.

Fault Messages:

Fault Messages indicate a problem and appear on the LCD with the highest priority. If more than one fault is detected, messages cycle. (Alternate messages may occur when downloading font, firmware, or Boot Loader files.)

☑ ***Note:*** *To return operation after a fault occurs, the fault must be corrected and the FEED Key pressed.*

Fault Messages		
Displayed Message	**Description**	**Action(s)**
24V OUT OF TOLERANCE	The printer has detected a drop in the 24-volt power supply.	Try cycling the printer power OFF and ON. If the fault does not clear, call for service.
ADC FAULT	The printer has detected an analog to digital circuit converter failure.	Try cycling the printer power OFF and ON. If the fault does not clear, call for service.

Fault Messages (continued)

Fault Messages		
Displayed Message	**Description**	**Action(s)**
CUTTER FAULT	The printer has detected a cutter mechanism fault.	**⚠ WARNING!** Use extreme care. Turn OFF and unplug the printer before proceeding. Examine the cutter for obstructions and ensure its cable is properly connected. Plug in and turn ON the printer. Press the FEED Key. If the fault does not clear, call for service.
DMA FAULT	The printer has detected a Direct Memory Access failure.	Try cycling the printer power OFF and ON. If the fault does not clear, call for service.
GAP MODE CANNOT CALIBRATE	Consistently low sensor readings were detected.	Press any key to continue. Ensure that media was inserted in the sensor during the appropriate calibration step; also ensure that the sensor is clean. Retry the calibration. If the problem persists, try Advanced Entry Calibration; see Section 5.2.2.
GAP MODE FAULTY SENSOR	Consistently high sensor readings were detected.	Press any key to continue. Ensure that media was removed from the sensor during the appropriate calibration step; also ensure that the sensor is clean. Retry the calibration. If the problem persists, call for service.

Fault Messages (continued)

Fault Messages		
Displayed Message	**Description**	**Action(s)**
OUT OF STOCK	The printer cannot detect media.	Try the following procedures: • Load media. Ensure that the labels are passing through the Media Sensor and, if necessary, Readjust the Media Sensor over the TOF mark; see Section 3.3. Also, if using media with large gaps, adjust the PAPER OUT DISTANCE (see Section 4.2.2); or, • Calibrate the printer; see Section 5.2.
POSITION FAULT	One of the following has occurred: • An update was made to the application version; • The printer was powered-off or reset during a ribbon, out of stock or TOF fault; or, • The printer was unable to complete the calibration.	Try one of the following procedures: • Press the FEED Key then clear any related fault condition; or, • Calibrate the printer; see Section 5.2.
PRESENT SENSOR FAULT	The printer cannot detect the Present Sensor.	Ensure that the option is installed properly. Try cycling the power OFF and ON. If the fault does not clear, call for service.
PRINT ENGINE FAULT	The printer has detected a problem within the print logic.	Try cycling the power OFF and ON. If the fault does not clear, call for service.
RAM FAULT	The system has detected a memory failure.	Try cycling the power OFF and ON. If the fault does not clear, call for service.

Fault Messages (continued)

Fault Messages		
Displayed Message	**Description**	**Action(s)**
REFLECTIVE MODE CANNOT CALIBRATE	Consistently low sensor readings were detected.	Press any key to continue. Ensure that the reflective mark is inserted facedown in the media sensor during calibration; also, ensure that the reflective mark is made of carbon based ink; and, that the sensor is free of debris. Retry calibration. If the problem persists, try Advanced Entry Calibration; see Section 5.2.2.
REFLECTIVE MODE FAULTY SENSOR	Consistently high sensor readings were detected.	Press any key to continue. Ensure that media was removed from the media sensor during the appropriate calibration step; also ensure that no labels are stuck in the media sensor. Retry the calibration. If the problem persists, call for service.
RIBBON FAULT	One of the following has occurred: • The ribbon sensor values have changed; or, • No ribbon supply hub rotation or only intermittent movement has been detected.	Try the following procedures: • Ensure that ribbon is correctly loaded and that the printhead assembly is locked; • Remove any obstruction that may inhibit ribbon hub movement; • Ensure that the ribbon core fits snugly on the ribbon supply hub; and, • Ensure that the ribbon and label combination is not slipping; see Section 7.2.2 for recommended media and ribbon combinations.

Fault Messages (continued)

Fault Messages		
Displayed Message	**Description**	**Action(s)**
SCANNER FAULT	The Scanner could not pass a bar code. ☑ ***Note:*** *This is normal when a bar code is unreadable.*	Press the FEED Key to clear. If the bar code is free from anomalies (e.g., voids, insufficient quiet zones, etc.) yet the fault continues, try the following: 1) Ensure that the bar code is capable of being read by the scanner; see the option's documentation or the *Class Series 2 Programmer's Manual*. 2) Adjust the Heat value. 3) Enable only those bar codes to be decoded. 4) Decrease the Print Speed or increase the height of the bar code. 5) Decrease the Verification Level. 6) Ensure the ribbon used contains carbon-based inks. 7) Ensure that the label stock has a matte finish. If the fault does not clear, and the bar code is readable on other equipment, the scanner may need alignment; consult the option's instructions, or call for service.
TEMPERATURE FAULT	The printer has shutdown to allow the printhead temperature to cool.	Turn OFF the printer until cool to prevent permanent damage. See Section 7.1 for environmental specifications.

Fault Messages (continued)

Fault Messages		
Displayed Message	**Description**	**Action(s)**
TOP OF FORM FAULT	The printer could not find the TOF within the maximum label length setting, or TOF occurred in an unexpected place. ☑ ***Note:*** *When using reflective media, this fault is given for an Out of Stock condition.*	*If media is moving:* 1) Press the FEED Key. It may be necessary to re-calibrate the printer; see Section 5.2. 2) The Media Sensor may be out of position. Readjust it; see Section 3.3. 3) The media may not be properly loaded. Reload media, also ensure that the Media Guide is positioned properly; see Section 3.2. 4) The Leveling Cam may be improperly adjusted; see Section 5.4.1. 5) The label may be longer than the default value for maximum length. Check the Media Settings / Maximum Label Length; see Section 4.2.2. 6) The Media Sensor may be obstructed. Check and carefully remove any obstruction (labels, paper dust, adhesive, etc). *If media is not moving:* The printhead assembly may not be locked.
VERIFIER FAULT	The Verifier could not pass a bar code. ☑ ***Note:*** *This is normal when a bar code is unreadable.*	Simultaneously press the ENTER and F1 Keys on the Verifier to clear the fault. If the fault persists, consult the option's instructions.

6.2 Hex Dump Mode

Hex Dump Mode is a useful tool for diagnosing problems, including communication and DPL™ syntax errors, allowing a comparison of input strings (sent by host) to output data (received by printer). To decode this information, the *Class Series 2 Programmer's Manual* is an essential reference.

To begin, go to DIAGNOSTICS and enable HEX DUMP MODE; see Section 4.2.7. Exit the menu and save your changes. Afterward, HEX DUMP MODE will be indicated by the LCD and all data sent to the printer will be output in hexadecimal code along with the ASCII equivalents.

After sending a label format to the printer, the output will be immediate (see sample below). As a final note, many software programs use bit mapping to construct the format, making diagnosis difficult. Contact Datamax Technical Support with any questions.

```
0000  02 4C 0D 44 31 31 0D 31  ^L D11 1
0008  36 31 31 30 30 30 30 33  61100003
0010  32 30 30 30 31 30 46 4F  200010FO
0018  4E 54 20 36 3A 20 41 4C  NT 6: AL
0020  4C 20 56 41 4C 49 44 20  L VALID
0028  20 20 20 20 20 20 20 20
0030  20 20 20 0D 31 36 31 31     .1611
0038  30 30 30 30 32 38 30 30  00002800
0040  30 31 30 20 20 20 20 20  010
0048  20 20 20 43 48 41 52 41     CHARA
0050  43 54 45 52 53 3A 0D 31  CTERS:.1
0058  36 31 31 30 30 30 30 32  61100002
0060  34 30 30 30 31 30 23 24  400010#$
0068  25 26 28 29 2A 2B 2E 2D  %&()*+.-
```

☑ **Note:** *To return to Ready Mode, re-enter the DIAGNOSTICS and disable HEX DUMP MODE. Exit the menu and save the changes.*

7 Specifications

7.1 General

Bar Codes

Code 39, Interleaved 2 of 5, Code 128 (subsets A, B and C), Codabar, LOGMARS, UPC-A, UPC-E, UPC 2 & 5 digit addendums, EAN-8, EAN-13, EAN 2 & 5 digit addendums, UPC Random Weight, Code 93, Plessey, Universal Shipping Container Symbology, Code 128 MOD 43, Postnet, USS/EAN-128 Random Weight, Telepen, USD-8 (Code 11), UPS MaxiCode (modes 2 & 3), PDF417, Data Matrix, QR Code, Aztec, and MicroPDF417. (See the *Class Series 2 Programmer's Manual* for details.)

Fonts

9 Bit-Mapped Fonts; CG Triumvirate™ Scalable Font; and, CG Triumvirate™ Condensed Bold Scalable Font. (See the *Class Series 2 Programmer's Manual* for details.)

Communications

Interfaces:	EIA RS-232/DB-25 Serial & IEEE 1284 Compliant Parallel
Serial Data Rates:	1200, 2400, 4800, 9600, 19.2K, and 38.4K baud.
Handshaking:	Xon / Xoff & CTS / DTR
Parity:	Even, Odd, or None
Stop Bits:	1 or 2
Data Bits:	7 or 8

Electrical

Input Voltage:	90 – 132 or 180 – 264 VAC @ 47–63 Hz, auto-ranging.
Power Consumption:	Typical Operating: 90 Watts; Standby: 10 Watts
Grounding:	Unit must connect to a properly grounded receptacle.

Environmental

Operating Temperature:	32° F – 100° F (0° C to 38° C)
Storage Temperature:	0° F – 140° F (-17° C to 60° C)
Humidity:	10% – 95% non-condensing
Dust:	Non-conducting, non-corrosive
Electromagnetic Radiation:	Moderate RF fields can be tolerated

Mechanical

Height:	12.70 inches (322.6 mm)
Width:	12.62 inches (320.6 mm)
Depth:	18.60 inches (472.5 mm)
Weight:	45 pounds (20.5 kg)

Printing

Type:	Direct Thermal or optional Thermal Transfer
Speed:	2 – 6 IPS (51 – 152 MMPS): *I-4206* 2 – 8 IPS (51 – 203 MMPS): *I-4208* 2 – 12 IPS (51 – 305 MMPS): *I-4212* 2 – 8 IPS (51 – 203 MMPS): *I-4308* 2 – 6 IPS (51 – 152 MMPS): *I-4406* 2 – 4 IPS (51 – 102 MMPS): *I-4604*
Printhead Resolution:	203 DPI (8.0 dots/mm): *I-4206, I-4208, I-4212* 300 DPI (11.8 dots/mm): *I-4308* 406 DPI (16.0 dots/mm): *I-4406* 600 DPI (23.6 dots/mm): *I-4604*
Nominal Dot Size:	.0043” X .0052” (.11 mm X .13 mm): *I-4206, I-4208, I-4212* .0027” X .0043” (.07 mm X .11 mm): *I-4308* .0013” X .0018” (.05 mm X .07 mm): *I-4406* .0008” X .0015” (.03 mm X .06 mm): *I-4604*
Printhead Protection:	Thermistor pauses operation upon over-temperature detection then resumes printing after cool-down.

Printing (continued)

Maximum Print Width:	4.10” (104.0 mm): *I-4206, I-4208, I-4212* 4.16” (105.7 mm): *I-4308* 4.10” (104.0 mm): *I-4406* 4.16” (105.7 mm): *I-4604*
Print Length Range:	.25”- 99” (6.4 - 2514.6 mm): *I-4206, I-4208, I-4212, I-4308* .25”- 84” (6.4 - 2133.6 mm): *I-4406* .25”- 55” (6.4 - 1397 mm): *I-4604*
with cutter:	1.25”- 99” (31.8 - 2514.6 mm): *I-4206,I-4208, I-4212, I-4308* 1.25” - 84” (31.8 - 2133.6 mm): *I-4406* 1.25” - 55” (31.8 - 1397 mm): *I-4604*
with peel & present:	1.50” - 99” (38 – 2514.6 mm): *I-4206, I-4208, I-4212, I-4308* 1.50” - 84” (38 – 2133.6 mm): *I-4406* 1.50” - 55” (38 – 1397 mm): *I-4604*
Print Justification:	Left
Flash Memory:	1 MB: *I-4206, I-4208* 2 MB: *I-4212, I-4308, I-4406, I-4604*
SDRAM Memory:	8 MB: *I-4206, I-4208* 16 MB: *I-4212, I-4308, I-4406, I-4604*
Media Types:	Roll-Fed, Die-Cut, Continuous, and Fan-Fold. Flat on the printable side with no more than .0007” (.018 mm) protrusions on the opposite side.
Media Roll Capacity:	8” (203 mm) outer diameter, wound out labels only
Media Core:	1.5” or 3.0” (38 mm or 76.2 mm) inner diameter
Ribbon Core:	1.010” ± .006” (25.6 mm ± .2 mm) inner diameter. Core not to protrude beyond ribbon edge.
Ribbon Width Range:	1.0” – 4.5” (25.4 mm – 114.3 mm), where Coated Side In and Coated Side Out ribbon is NOT interchangeable and is specified by the Thermal Transfer option type; also, width should slightly exceed that of the media and backing, if any, to protect the printhead.
Ribbon Length:	1968 feet (600 meters) maximum

7.2 Approved Media and Ribbon

To achieve optimum print quality and maximum printhead life, *DATAMAX*® brand media and ribbons must be used. These supplies are specially formulated for use in this printer. The use of non-Datamax supplies may affect the print quality, performance, and life of the printer or its components (see the Warranty Statement). For a current list of approved media and ribbons, contact a Media Representative at (407) 523-5650.

Media selection is an important determinant in the throughput, quality, and performance of the printed product. General factors to consider are listed below:

Direct Thermal –

- The abrasiveness of the material covering the reactive layer of the media.
- The amount of heat required to start the chemical reaction.
- The ability of the media to control the chemical reaction.

Thermal Transfer –

- The combination of top coatings and ribbons may affect image quality.
- The ribbon back coating can provide printhead protection and, depending upon the formula, help reduce static buildup.
- The ribbon width, when slightly wider than the media, can also guard against abrasion.

7.2.1 Controlling Print Quality

The printer provides flexible print controls. Of these, the amount of heat applied and the rate of media movement will have the most effect on the printed output. Four settings are available via PRINT CONTROL (see Section 4.2.3):

- HEAT sets the printing energy level, where lower amounts lighten the image and higher amounts darken it;
- PRINT SPEED adjusts throughput, where slow speeds allow more time for energy transfer and fast speeds may require more HEAT to achieve the desired contrast;
- CONTRAST fine-tunes the gray (shaded) areas of the image; and,
- DARKNESS fine-tunes the black areas of the image.

☑ ***Note:*** *Depending on HOST SETTINGS, some print quality settings can be overridden by the host; see Section 4.2.6.*

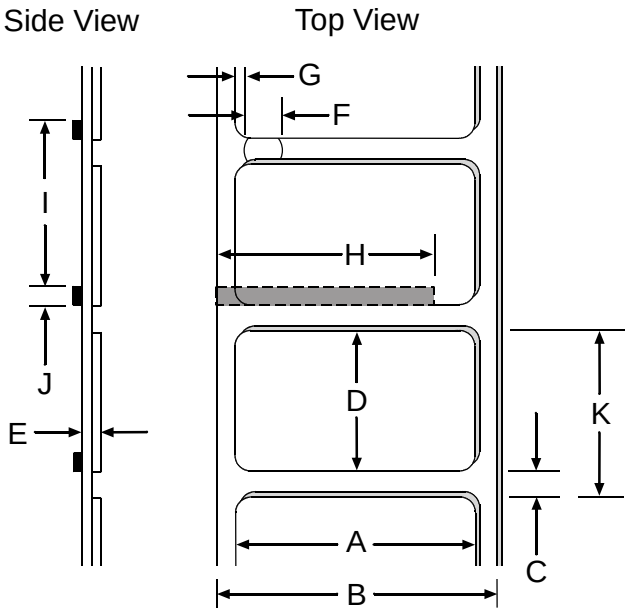
7.2.2 Media and Ribbon Requirements

Suggested applications are listed in the following table (and for specific information consult a Datamax Media Representative or other qualified specialist):

Media and Ribbon Overview				
Thermal Transfer	**Ribbon Type**	**Print Speed***	**Print Energy**	**Image Durability**
Great Label TTL™	GPR Plus™	10 – 12**	Medium	Medium
Coated and Uncoated Paper, Tag Stock, Some Films, Some Synthetics	Wax GPRPlus™	2 – 10	Low	Low
Coated and Glossy Paper, Tag Stock, Some Synthetics, Films	Wax/Resin PGR+	2 – 8	Medium	High
Synthetics, Films	Resin SDR	4 – 6	High	High
Direct Thermal	**Ribbon Type**	**Print Speed***	**Print Energy**	**Image Durability**
Datamax DTL-HSM Thermal Paper	N/A	10 – 12**	Medium	Low
Datamax DTL-HSH Thermal Paper	N/A	10 – 12**	Medium	Low

** Given in inches per second.*
*** Highly recommended for optimum quality at speeds above 10 IPS.*

Dimensional Requirements are listed in the following table:



Media Dimensional Requirements			
Designator	**Description**	**Minimum** [1]	**Maximum** [1]
A	Label width	1.00	4.65
B	Liner width	1.00	4.65
C	Gap (or notch) between labels[3]	.10	–
D	Label length[3]	.25	–
E	Media thickness	.0025	.010
F	Notch opening width	.20	.500
G	Media edge to sensor aperture distance	.20	2.25
H	Reflective (black) mark width[2]	.50	4.65
I	Distance between reflective marks[3]	.50	–
J	Reflective mark length[3]	.10	–
K	Label repeat distance[3]	.35	–

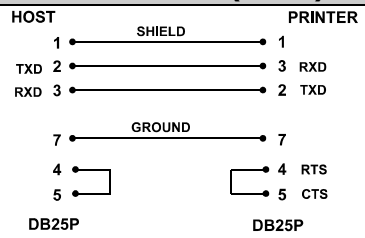
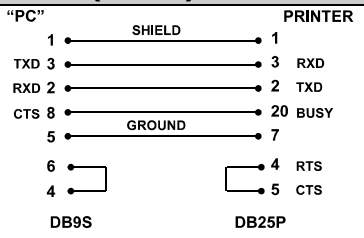
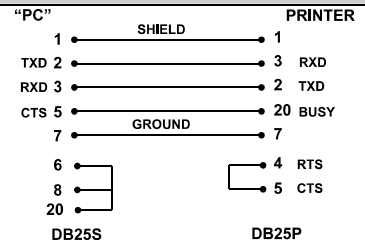
[1] Units of measure are given in inches and referenced by the direction of label feed.

[2] 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.

[3] The maximum allowable length of the combined label and gap (or mark) measurement cannot exceed 99.99 inches.

7.3 Serial Cable Requirements

Wiring diagrams, suggested applications, and part numbers for serial interface cables are given in the table below. (Contact a reseller for ordering information.)

<table>
<tr><th colspan="2">Applicable Serial Interface Cables</th></tr>
<tr><th>Null Modem (MXM)</th><th>“PC” (DB9P) to Printer</th></tr>
<tr><td> 
</td><td> 
</td></tr>
<tr><td>Part Number 556000</td><td>Part Number 556001</td></tr>
<tr><td>For connection to other DCE equipment. Flow control is only Xon/Xoff.</td><td>For connection to a PC compatible with DB9P communication ports. Flow control can be either Xon/Xoff or CTS/DTR.</td></tr>
<tr><th>“PC” (DB25P) to Printer</th><th>RS-422 Connection</th></tr>
<tr><td> 
</td><td> 
</td></tr>
<tr><td>Part Number 556002</td><td>Part Number N/A</td></tr>
<tr><td>For connection to a PC compatible with DB25 communication ports, flow control can be either Xon/Xoff or CTS/DTR.</td><td>Optional equipment, diagram only provided for reference.</td></tr>
</table>

Appendix A

Module Assignments

Memory Module			
Designator	**Module Size**	**Volatile***	**Location / Use**
D	1024 KB (default size)	Yes	Main logic card SDRAM – for graphics, fonts, and formats
F	4 MB	No	Optional GPI/O Multi-Expansion Card – for graphics, fonts, and formats
G	256 KB	No	Main logic card Flash – for graphics, fonts, and formats (all models except I-4206 and I-4208).
Y	64 KB	No	Main logic card Flash – reserved for EFIGS
Z	4 MB	No	Optional GPI/O Multi-Expansion Card – reserved for ILPC

**When power is removed, stored data will be lost.*

Print Resolutions and Maximum Label Widths

Resolutions and Widths				
Model	**Printhead Resolution**	**Maximum Print Width**		**Default Setting**
		Inches	**Millimeters**	
I-4206, I-4208, & I-4212	203 dots/inch (8 dots/mm)	4.10	104.0	4.10
I-4308	300 dots/inch (11.8 dots/mm)	4.16	105.7	4.16
I-4406	406 dots/inch (16 dots/mm)	4.10	104.0	4.10
I-4604	600 dots/inch (23.6 dots/mm)	4.16	105.7	4.16

Available Speeds and Default Settings

Printer Speed Ranges and Defaults*					
Model	**Function**	**Speed Range**		**Default Setting**	
		IPS	**MMPS**	**IPS**	**MMPS**
I-4206	Print	2 – 6	51 – 152	6.0	152
	Feed	2 – 8	51 – 203	6.0	152
	Reverse	2 – 4	51 – 102	4.0	102
	Slew	2 – 6	51 – 152	6.0	152
I-4208	Print	2 – 8	51 – 203	8.0	203
	Feed	2 – 8	51 – 203	8.0	203
	Reverse	2 – 4	51 – 102	4.0	102
	Slew	2 – 8	51 – 203	8.0	203
I-4212	Print	2 – 12	51 – 305	8.0	203
	Feed	2 – 12	51 – 305	8.0	203
	Reverse	2 – 4	51 – 102	4.0	102
	Slew	2 – 12	51 – 305	8.0	203
I-4308	Print	2 – 8	51 – 203	6.0	152
	Feed	2 – 8	51 – 203	6.0	152
	Reverse	2 – 4	51 – 102	4.0	102
	Slew	2 – 8	51 – 203	6.0	152
I-4406	Print	2 – 6	51 – 152	5.0	127
	Feed	2 – 6	51 – 152	5.0	127
	Reverse	2 – 4	51 – 102	4.0	102
	Slew	2 – 6	51 – 152	5.0	127
I-4604	Print	2 – 4	51 – 102	3.0	76
	Feed	2 – 4	51 – 102	3.0	76
	Reverse	2 – 4	51 – 102	4.0	102
	Slew	2 – 4	51 – 102	3.0	76

**Consult the* Class Series 2 Programmer's Manual.

Appendix B

Custom Adjustment Ranges

Row, Column, and Present Adjust Ranges *(in dots)*			
Model	**Row Adjust**	**Column Adjust, and Present Adjust**	**Default Setting**
I-4206, I-4208, & I-4212	-100 – 2030	-100 – 100	000
I-4308	-150 – 3000	-150 – 150	
I-4406	-200 – 4060	-200 – 200	
I-4604	-300 – 6000	-300 – 300	

Column & Row Emulation Ranges

Emulation Range *(in dots)*			
Model	**Column**	**Row**	**Default Setting**
I-4206, I-4208, & I-4212	153 – 203	103 – 303	203
I-4308	250 – 300	200 – 400	300
I-4406	356 – 406	306 – 506	406
I-4604	550 – 600	500 – 700	600

Appendix C

Menu Multi-Language Support

The printer allows new menu languages and / or replacement of the Datamax provided translations. A Microsoft® Excel Spreadsheet defines the menu dictionary and a new language column is added or an existing column modified. Then, by clicking on the "Generate DPL file(s)" radio button, the generated DPL file(s) is sent to the printer.

Here are the highlights and restrictions of the feature:

- The printer can register up to 10 different display languages, including EFIGS.
- The EFIGS languages and any additional languages are stored on Module Y: a 64KB Flash Module located on the main logic card.
- It is okay to download menu files generated for a lesser firmware revision to new firmware – any messages that are not defined are displayed in English.
- For the procedures below, the printer will accept the menu downloads from any available port.
- The language creation programs support Windows® 95, Windows® 98, Windows® NT, and Windows® 2000.

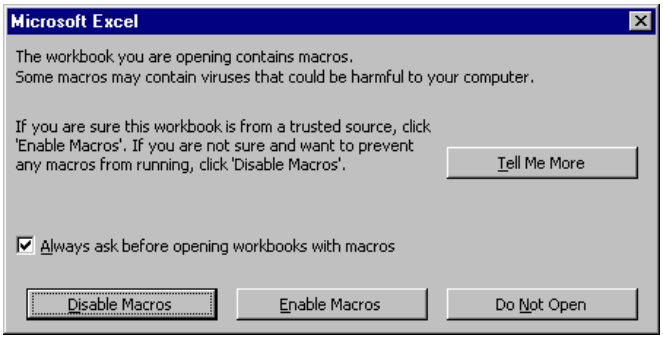
Required Software	Comment
I-Class Application Version 3.0 or greater[1]	Must reside in the target printer. (See Section 5.7)
Microsoft® Excel 97	Must be purchased by user.
Img2dl.exe[1] [2]	Program used during the process to create DPL file.
Gemmsgxls.xls[1] [2]	Menu Dictionary

[1] *Provided software files and programs at* ftp://ftp.datamaxcorp.com/Printer Firmware/EFIGS-A.I.M.W.Class/

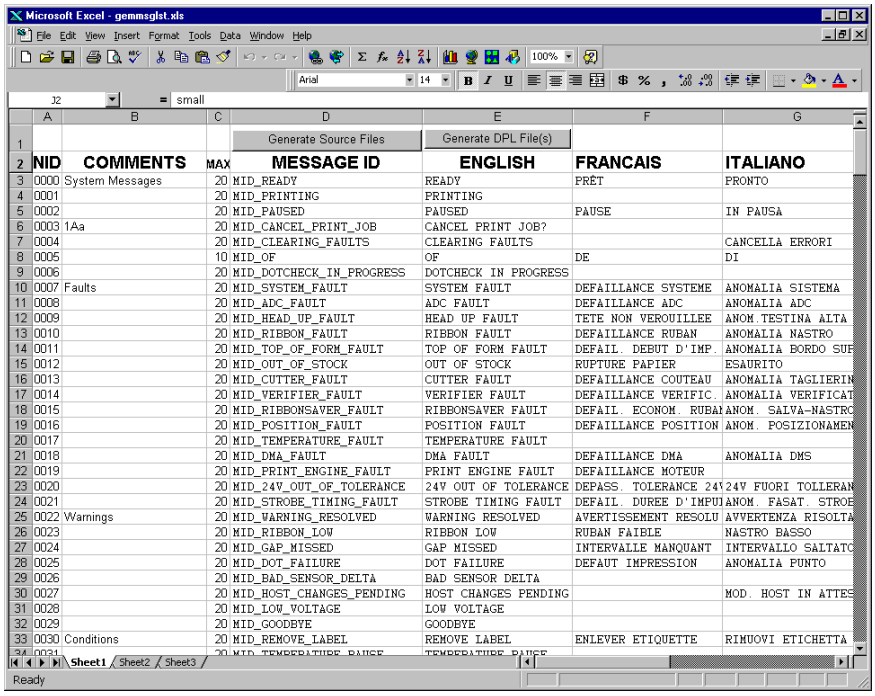
[2] *Recommend that the Img2dl.exe and Gemmsgxls.xls files reside in the same directory.*

Creating a Menu Language:

❶ Invoke Excel and open the gemmsglst.xls file. Excel opens the file and the following screen appears.



❷ Click the “Enable Macro” box and the following appears:



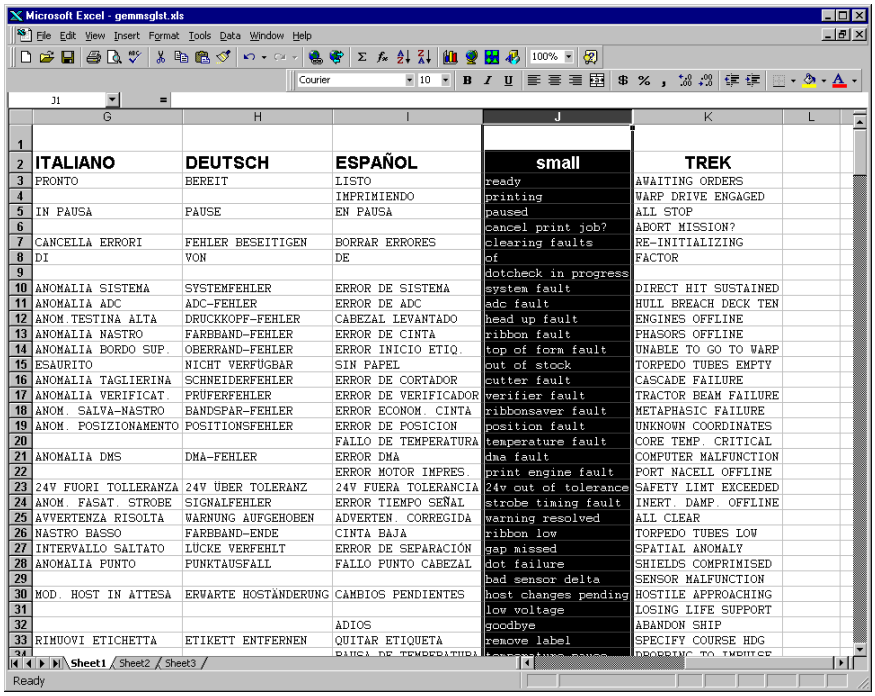
Click On Column J and enter your new language, or modify an existing one.

Tips:

A) Message Size – When entering new messages, reference the “MAX” column: this is the maximum number of characters allowed for this field. Warnings are displayed when the number of characters is exceeded or when trying to modify the MAX value. Beware that “cutting” and “pasting” fields could defeat this warning system.

B) Two Line Messages – Some of the message are displayed as two lines. These are indicated in the comment fields.

C) Comments – This field can be modified with no effect.



Microsoft Excel - gemmsglst.xls

	G	H	I	J	K	L
1						
2	ITALIANO	DEUTSCH	ESPAÑOL	small	TREK	
3	PRONTO	BEREIT	LISTO	ready	AWAITING ORDERS	
4			IMPRIMIENDO	printing	WARP DRIVE ENGAGED	
5	IN PAUSA	PAUSE	EN PAUSA	paused	ALL STOP	
6				cancel print job?	ABORT MISSION?	
7	CANCELLA ERRORI	FEHLER BESEITIGEN	BORRAR ERRORES	clearing faults	RE-INITIALIZING	
8	DI	VON	DE	of	FACTOR	
9				dotcheck in progress		
10	ANOMALIA SISTEMA	SYSTEMFEHLER	ERROR DE SISTEMA	system fault	DIRECT HIT SUSTAINED	
11	ANOMALIA ADC	ADC-FEHLER	ERROR DE ADC	adc fault	HULL BREACH DECK TEN	
12	ANOM.TESTINA ALTA	DRUCKKOPF-FEHLER	CABEZAL LEVANTADO	head up fault	ENGINES OFFLINE	
13	ANOMALIA NASTRO	FARBBAND-FEHLER	ERROR DE CINTA	ribbon fault	PHASORS OFFLINE	
14	ANOMALIA BORDO SUP.	OBERRAND-FEHLER	ERROR INICIO ETIQ.	top of form fault	UNABLE TO GO TO WARP	
15	ESAURITO	NICHT VERFÜGBAR	SIN PAPEL	out of stock	TORPEDO TUBES EMPTY	
16	ANOMALIA TAGLIERINA	SCHNEIDERFEHLER	ERROR DE CORTADOR	cutter fault	CASCADE FAILURE	
17	ANOMALIA VERIFICAT.	PRÜFERFEHLER	ERROR DE VERIFICADOR	verifier fault	TRACTOR BEAM FAILURE	
18	ANOM. SALVA-NASTRO	BANDSPAR-FEHLER	ERROR ECONOM. CINTA	ribbonsaver fault	METAPHASIC FAILURE	
19	ANOM. POSIZIONAMENTO	POSITIONSFEHLER	ERROR DE POSICION	position fault	UNKNOWN COORDINATES	
20			FALLO DE TEMPERATURA	temperature fault	CORE TEMP. CRITICAL	
21	ANOMALIA DMS	DMA-FEHLER	ERROR DMA	dma fault	COMPUTER MALFUNCTION	
22			ERROR MOTOR IMPRES.	print engine fault	PORT NACELL OFFLINE	
23	24V FUORI TOLLERANZA	24V ÜBER TOLERANZ	24V FUERA TOLERANCIA	24v out of tolerance	SAFETY LIMT EXCEEDED	
24	ANOM. FASAT. STROBE	SIGNALFEHLER	ERROR TIEMPO SEÑAL	strobe timing fault	INERT. DAMP. OFFLINE	
25	AVVERTENZA RISOLTA	WARNUNG AUFGEHOBEN	ADVERTEN. CORREGIDA	warning resolved	ALL CLEAR	
26	NASTRO BASSO	FARBBAND-ENDE	CINTA BAJA	ribbon low	TORPEDO TUBES LOW	
27	INTERVALLO SALTATO	LÜCKE VERFEHLT	ERROR DE SEPARACIÓN	gap missed	SPATIAL ANOMALY	
28	ANOMALIA PUNTO	PUNKTAUSFALL	FALLO PUNTO CABEZAL	dot failure	SHIELDS COMPRIMISED	
29				bad sensor delta	SENSOR MALFUNCTION	
30	MOD. HOST IN ATTESA	ERWARTE HOSTÄNDERUNG	CAMBIOS PENDIENTES	host changes pending	HOSTILE APPROACHING	
31				low voltage	LOSING LIFE SUPPORT	
32			ADIOS	goodbye	ABANDON SHIP	
33	RIMUOVI ETICHETTA	ETIKETT ENTFERNEN	QUITAR ETIQUETA	remove label	SPECIFY COURSE HDG	

Sheet1 / Sheet2 / Sheet3

Ready

❹ When editing has been completed, highlight all of the columns you desire to create (more than one language may be selected) by pressing the letter above the column.

❺ Press the Generate DPL File(s) radio button. A file will be generated for each of the selected columns and Excel will provide confirmation. (Example: small.ls)

❻ Download the generated files to the printer – one method is the DOS copy command:

```
copy small.ls lpt1: /b
```

❼ Reset the printer by pressing and holding the CANCEL Key for approximately four seconds.

❽ Verify the operation by printing a Configuration Label (see Section 4.3.2). The new font selection will be printed on the label under SYSTEM INFORMATION / OPTIONAL LANGUAGES or select the new language in the SYSTEM SETTINGS / MENU LANGUAGE in the printer's menu.

This is the only method to determine whether the download was successful. If the menu displays the new language selection, but all messages remain in English an error has occurred. Re-check the process.

Contact Datamax Technical Support if problems continue (be prepared to provide the Gemmsglst.xls and the DPL download file that you have created). Other possible error messages are as follows:

Menu Language Error Message	Description
Please select the entire column(s) or the desired language(s), by clicking on the column letter(s)	After pressing the Generate DPL File(s) radio button, the languages to convert were not correctly selected.
Message text may not exceed MAX = xx designated characters for this MID	The entered message exceeds the number of characters specified in column C. You may not modify this number.

Advanced File Handling Information

- EFIGS is standard, loaded into Module Y. Module Y is LOCKED and will only accept additional Language Downloads.
- After downloading a language update, Module Y is left UNLOCKED until the printer is reset or power is cycled. In this state, Module Y will accept font, image and label format downloads. The module will also honor the Clear Module request. Therefore, following an update it is recommended that a reset be performed to lock the module; otherwise, a software package may “Clear All Modules” thus destroying the new menu language(s).
- Module Y can be UNLOCKED by sending this DPL string: <STX>KpY0.
- To restore the factory generated EFIGS image, download the file *832296.01A to the printer. This file is located on the Datamax FTP site. The letter at the end of the file name (e.g., A) specifies the revision. The latest revision will be available on the FTP site.
- Downloading the same language twice will automatically delete the first occurrence, but will not free the memory space. Use the Pack Module feature (see Section 4.2.4) or reload the EFIGS file to free the space.
- Deletion of the selected language will set the printer to English.
- The total number of languages that the printer can now accept is limited to 10, but this number is dependent upon the size of each language translation. The translation size will vary with the number of messages that are translated for that particular language. Current complete language files are about 7,000 bytes each but with product growth, the total number of languages is expected to drop to seven.

Appendix D

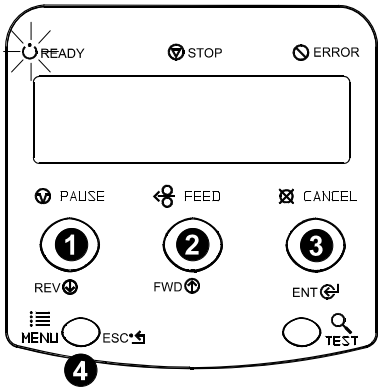
Configuration Files

With application version 5.01 and above, the printer can save and restore complete printer settings, including media calibration parameters, in internal Configuration Files. Here are the highlights and restrictions of the feature:

- Eliminates the need to repeat the manual steps of a special printer setup, making future changeovers faster and easier.
- Can be setup, saved, and restored either from the host or via the front panel as “C-type” files on Module Y under unique filenames of up to nineteen characters in length.
- Enables the host, via special DPL commands, to control parameters previously accessible only from the front panel.

☑ Note: *If file sharing among printers, do not include unique parameters (such as calibrations and adjustments).*

When using the front panel to save a configuration file (see Section 4.2.5), the keypad functions are as follows:



❶ REV

The DOWN ARROW Key scrolls down through the alphanumeric, underscore, and delete character.

❷ FWD

The UP ARROW Key scrolls up through the alphanumeric and underscore characters, and the delete function.

❸ ENT

The ENTER Key accepts the displayed character and advances the cursor.

❹ ESC

The ESCAPE Key saves the displayed file.

Follow the steps below to save a manually entered setup as a configuration file:

Step	Displayed Message	Action	Comment
1	READY	Press the MENU Key.	You are entering MENU MODE.
2	MENU MODE SYSTEM SETTINGS	Use the FWD Key to scroll to SYSTEM SETTINGS then press it once again to select it.	The REV Key can also be used. You are entering SYSTEM SETTINGS.
3	SYSTEM SETTINGS CONFIGURATION FILE	Press the ENT Key to select CONFIGURATION FILE.	You are entering the CONFIGURATION FILE submenu.
4	CONFIGURATION FILE RESTORE AS CURRENT	Press the FWD Key to scroll to SAVE SETTING AS.	The REV Key can also be used.
5	CONFIGURATION FILE SAVE SETTING AS	Press the ENT Key.	Press the ESC Key to exit this selection.
6	SAVE SETTING AS :	Enter a file name using the FWD Key to scroll through the characters.	The REV Key can also be used.
		☑ ***Note:*** *To change an accepted character, select the delete function (solid flashing block) then press the ENTER Key.*	
7	SAVE SETTING AS SPECIAL :	Use the ENT Key to accept the character.	Continue entering the file name in this manner ("SPECIAL STOCK" has been used as an example).
		☑ ***Note:*** *To abort the Save function, delete all entered characters in the file name then press the ESCAPE Key.*	
8	SPECIAL STOCK SUCCESSFUL	Press the ESC Key repeatedly to save the file name and return to Ready.	Save complete. (To restore a saved file, see Section 4.2.5.)

Appendix E

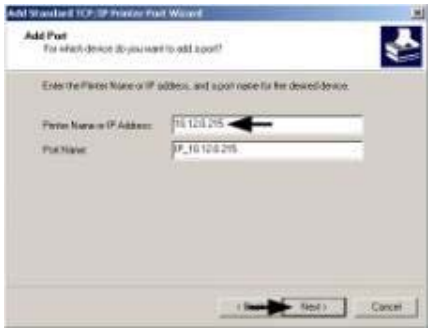
Printer Driver and Port Setup

Install the Printer Driver and Port software according to the host's operating system. The example below highlights the driver installation for Windows XP; other installations will be similar.

Windows XP Driver and Port Installation

1	Start the Windows "Add Printer Wizard." The following screen should appear. Click Next>.		**2**	Ensure that Local Printer is selected and then click Next.	
3	Select on Create a new port: and then select Standard TCP/IP Port from the drop down menu. Click Next.		**4**	Click Next.	

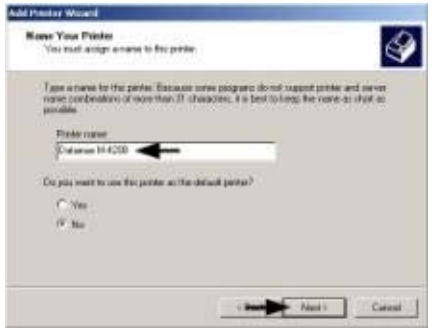
Windows XP Driver and Port Installation *(continued)*

5	In the Printer Name or IP Address field enter the IP address of your printer. The Port Name field does not need to be changed. When finished click “Next”.		**6**	Ensure Standard is selected and then click Next.	
7	Confirm your settings and then click Finish.		**8**	Click on Have Disk.	
9	Insert the Accessories CD-ROM and click Browse.		**10**	Browse to the “\DRIVERS\Seagull” folder on the CD-ROM, ensure the file “Datamax for 95, 98, ME, 2000, and xp.inf” is selected and click OK.	

11 Click OK.

12 Select your printer from the list and then click Next.

13 Name your printer in the Printer name: field. Next select whether or not to set this printer as your default printer. Then Click Next.



14 Select whether or not to share this printer on your network. Then Click Next.

15 Select No then Click Next.

16 Confirm your settings and then click Finish.

17 If prompted with the "Digital Signature Not Found" window, click “Continue Anyway” to continue installation.

18 Your computer will now copy the necessary files from the CD-ROM.

The driver and port installation is now complete. The printer can be selected through any Window’s application.

Warranty Information

Datamax Barcode Products
Limited Warranty Statement

I-Class™ Printers

Printer

Datamax warrants* to Purchaser that under normal use and service, the I-Class™ Printers, (with the exception of the thermal printhead, platen roller, and belts) purchased hereunder shall be free from defects in material and workmanship for a period of three years, (1095 days), or three million (3,000,000) linear inches of use, whichever comes first, 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 that 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, Platen Roller, and Belts

This warranty* is limited to a period of one year, (365 days), or one million (1,000,000) linear inches of use, whichever comes first, for the I-Class™ thermal printhead, platen roller, and belts. 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 warranty. This warranty does not cover printheads or platen rollers which have been misused, altered, neglected, handled carelessly, or damaged due to improper cleaning or unauthorized repairs.

**When returned to the factory for service.*

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 one of the following locations:

Datamax Corporate Headquarters 4501 Parkway Commerce Boulevard Orlando, Florida 32808 USA	Datamax International Herbert House, Elizabeth Way, Pinnacles Harlow, Essex CM19 5FE United Kingdom

A Return Material Authorization (RMA) number must be issued before the product can be returned. To open an RMA, please call the Datamax Technical Support Department at (407) 523-5540. 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 media 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 ninety (90) 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.

Software is licensed on an "as is" basis without warranty. Except and to the extent expressly provided in this warranty and in lieu of all other warranties, there are no warranties, expressed or implied, including, but not limited to, any warranties of merchantability or fitness for a particular purpose.

Purchaser shall be solely responsible for the selection, use, efficiency and suitability of Datamax's products.

Limitation of Liability

In no event shall Datamax be liable to the purchaser for any indirect, special or consequential damages or lost profits arising out of or relating to Datamax's products, or the performance or a breach thereof, even if Datamax has been advised of the possibility thereof. Datamax's liability, if any, to the purchaser or to the customer of the purchaser hereunder shall in no event exceed the total amounts paid to Datamax hereunder by the purchaser for a defective product.

In no event shall Datamax be liable to the purchaser for any damages resulting from or related to any failure or delay of Datamax in the delivery or installation of the computer hardware, supplies or software or in the performance of any services.

Some states do not permit the exclusion of incidental or consequential damages, and in those states the foregoing limitations may not apply. The warranties here give you specific legal rights, and you may have other legal rights which vary from state to state.

Glossary

alphanumeric Consisting of alphabetic, numeric, punctuation and other symbols.

backing material The silicon-coated paper carrier material to which labels with adhesive backing are affixed (also referred to as “liner”).

bar code A representation of alphanumeric information in a pattern of machine-readable marks. The basic categories are divided into one-dimensional (UPC, Code 39, Postnet, etc.) and two-dimensional bar codes (Data Matrix, MaxiCode, PDF417, etc.).

boot loader The resident program that loads the application from Flash memory, decompresses it into the SRAM, and starts operations.

burn line The row of thermal elements in the printhead that create the images on the media.

calibration The process through which sensor readings are entered into the printer for correct sensor function (for example, detection of a given media type) and TOF positioning.

character set The entire complement of alphanumeric symbols contained in a given font.

checksum An alphanumeric error detection method used in many bar code symbologies for informational security.

continuous media An uninterrupted roll or box of label or tag stock media that contains no gap, notch, or mark to separate individual labels or tags.

core diameter The inside diameter measurement of the cardboard core at the center of a ribbon or media roll.

cutter A mechanical device with a rotary or guillotine type blade used to cut labels or tags following printing.

defaults The functional setting values returned following a factory reset of the printer.

diagnostics Programs used to locate and diagnose hardware problems.

die-cut media Media that has been cut into a pattern using a press, where the excess paper is removed leaving individual labels, with gaps between them, attached to a backing material.

direct thermal The printing method that uses a heat sensitive media and only the heat of the thermal printhead to create an image on the label.

direct thermal media Media coated with special chemicals that react and darken with the application of heat.

DPI (dots per inch) A measurement of print resolution, rated in the number of thermal elements contained in one inch of the printhead (also referred to as “resolution”).

DPL (Datamax Programming Language) programming commands used specifically for control of and label production in Datamax printers. A complete listing of commands can be found in the *Class Series 2 Programmer’s Manual.*

EFIGS English, French, Italian, German, Spanish, and other multi-language support as programmed for the menu and configuration label.

fan-fold Media that is folded and stacked.

feed speed The speed at which the media moves under the printhead in non-printed areas and between labels.

Flash memory Non-volatile memory (does not require printer power to maintain data) that can be erased and reprogrammed, used to hold the operating program.

font A set of alphanumeric characters that share a particular typeface.

gap A space between die-cut or notched labels used to sense the top-of-form.

IPS (inches per second) Imperial measurement of printer speeds.

label A paper or synthetic printing material, typically with adhesive backing.

label length The distance from the top of the label to the bottom of the label as it exits the printer.

label repeat The distance from the top of one label to the top of the next label.

label tracking Excessive lateral (side to side) movement of the media as it travels under the printhead.

label width The left to right measurement of the label as it exits the printer.

mark Generalized term for the carbon-based black line on the underside of reflective media used to indicate the top-of-form.

media Generalized term for all types of printing stocks, including: roll fed, continuous, die-cut, reflective, and fanfold.

media hub Device in the printer used to support roll media.

media sensor A photo-sensor device that detects media, and the top-of-form when using die-cut, notched or reflective media.

MMPS (millimeters per second) Metric measurement of printer speeds.

notched stock Media, typically tag stock, with holes or notches in the material that is used to signal the top-of-form. The printer must be set to “gap” to use this media type.

on demand An output regulator (i.e., the Present Sensor) that inhibits printing when a label is already present.

preprinted media Label stock that contains borders, text, or graphics, floodcoating, etc.

perforation Small cuts extending through the backing and/or label material to facilitate their separation (also referred to as “perf”).

print speed The speed at which the media moves under the printhead during the printing process.

reflective media Media imprinted with carbon-based black marks on the underside of the material, which is used to signal the top-of-form when the “reflective” sensor is enabled.

registration Repeatable top to bottom alignment of printed labels.

reverse speed The backward rate of media motion into the printer during tear-off, peel and present and cutting operations for positioning the label at the start of print position.

ribbon An extruded polyester tape with several layers of material, one of which is ink-like, used to produce an image on the label (also referred to as “foil”).

ribbon wrinkle An undesirable overlapping of the ribbon during the printing process that leads to voids on the printed label, typically caused by an improper printhead leveling cam adjustment.

roll media A form of media that is wound upon a core.

start of print The position on the label where the printing actually begins.

tag stock A heavy paper or synthetic printing material, typically featuring a notch or black mark for TOF and no adhesive backing.

thermal transfer The printing method that creates an image by transferring ink from a ribbon onto the media using the heat from the thermal printhead.

TOF (top-of-form) The start of a new label as indicated by a label gap, notch, mark or programming.

void An undesirable blank space in a printed image.