A CLASS™

Operator's Manual

Corporate Headquarters
4501 Parkway Commerce Blvd.
Orlando, Fl 32808
Phone: 407-578-8007
Fax: 407-578-8377

www.datamaxcorp.com

Asia-Pacific
19 Loyang Way
#01-01 CILC Building
Singapore 508724
Phone: +65 542-2611
Fax: +65 542-3611

Datamax International
Herbert House
12 Elizabeth Way, Pinnacles
Harlow, Essex CM19 5FE UK
Phone: +44 1279 772200
Fax: +44 1279 424448

Copyright Information:

Firmware (Software) Agreement:

Part Number: 88-2305-01

Revision C

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)

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

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

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

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 Numbers: DMX-A-4212
DMX-A-4310
DMX-A-4408
DMX-A-4604

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 Bassett 10/6/03

Signature and Date

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

Important Safety Instructions:

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

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

- Before using the print engine, carefully read all the installation and operating instructions.
- Moving parts are present during operation – keep body parts, loose clothing, etc. away from the mechanism.
- Observe all warning instruction labels on the print engine.
- Mount the print engine securely in the applicator system.
- Do not place the print engine on or near a heat source.
- To protect from overheating, make sure no openings on the print engine are blocked.
- Never insert anything into the ventilation slots and openings of the print engine.
- Do not use the print engine near water or spill liquid into it.
- Ensure that the AC power source complies with the ratings listed for the print engine. (If unsure, check with your dealer or local utility provider.)
- Do not place the AC power cord where it can be stepped on. If the AC power cord becomes damaged, replace it immediately.
- Consult only qualified, trained personnel to perform service on this print engine. There are no user-serviceable parts are inside; do not remove the cover.

Contents

Overview

Getting Started

Printer Setup

The User Interface

Adjusting and Maintaining the Printer

Troubleshooting

Appendix A

Appendix B

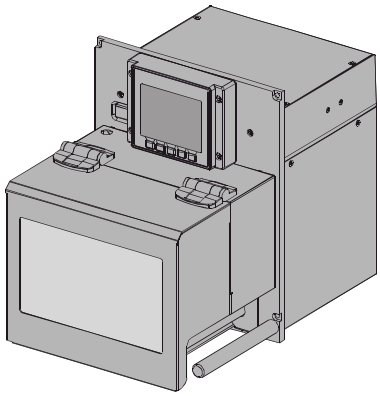
Appendix C

Appendix D

Appendix E

Appendix F

Overview



1.1 About the Printer

Congratulations on your purchase of the A-Class print engine. This print engine (hereafter referred to as "the printer") is designed for professional integration into an automated high-volume, high-speed industrial label applicator system. Featuring an advanced user interface and a Motorola Coldfire® 32-Bit microprocessor, this printer offers many standard and optional configurations for outstanding performance, management, and connectivity within your system.

This manual provides all the information necessary for installation, setup and operation. To begin printing, refer to the instructions provided with your label-creation software; or, if you are writing custom label programs, the *Class Series Programmer's Manual* has been included on the enclosed Datamax Accessories CD-ROM for your convenience. (This manual is also available on our web site at http://www.datamaxcorp.com).

The printer's model number is located on the Serial Tag for easy reference. Use this model number when referencing specific information within this manual. The following subsections detail the standard and optional features for the A-Class printer.

1.1.1 Standard Features

This printer offers the following standard features:

- Right-handed or left-handed configurations
- Electronics card cage
- 4 MB Flash downloadable program memory
- 16 MB DRAM memory
- Host computer accessible memory for object temporary storage
- Two RS-232 serial interfaces (one of which is also RS-422/RS-485 capable)
- One IEEE 1284 compliant parallel interface
- One USB v1.1 interface
- A programmable GPIO Port
- Backlit ¼ VGA graphic display panel
- EFIGS (English, French, Italian, German, and Spanish) display languages
- Industry standard bar code symbologies
- Time stamp at print capability with time and date battery back-up
- Static brushes
- Printhead resistance verification
- Configurable fault-handling capability with reprint and void selections
- Parse error-tolerant command language interpretation
- Internal test labels for verification, validation, and configuration
- Multiple setup restore capability
- Paper retract control after print
- Ribbon low detection and warning
- Power-up, mode, and resident option hardware diagnostics
- Option hardware auto-detection
- Media peel bar
- Media inch counters
- Input line mode (ASCII text input) capability
- Firmware upgrades downloadable
- AGFA Scaleable Font Engine featuring dynamic font attributes

1.1.2 Optional Features (available for all models except as noted)

The printer offers the following optional features:

- ***DMX 100*** – an external Network Interface Controller (NIC) providing Ethernet® connectivity.

- ***DMXNet*** – a network interface card that enables the printer to communicate over an Ethernet® network under a variety of operating systems including NetWare, Windows 95/98/2000/ME/XP, Windows NT™, and UNIX™. Some of the features are listed below:
  - Automatic selection of 10Base2 (Thinnet) or 100BaseT Fast Ethernet connection.
  - Integral HTTP Server to allow monitoring and management from a standard Web browser program.
  - Peer-to-Peer (serverless) discovery and printing from Windows 95/98/ME/XP or Windows NT/2000 workstations without a Novell file server present.
  - FTP printing to allow printing from a Web browser or other FTP client.
  - Dynamic Domain Name Service (DDNS).
  - Lightweight Directory Access Protocol (LDAP).
  - Novell "YES" certified.
  - Novell NetWare PSERVER (bindery-based and Novell Directory Services (NDS).
  - LPR/LPD over TCP/IP for UNIX platforms and Microsoft's Windows.
  - Raw sockets support over selectable TCP/IP port with filters for selected UNIX environment.
  - IP and IPX SNMP support of MIB-2, proprietary NIC MIB and public and proprietary (private) Printer MIB.
  - SNMP traps to alert administrators of printer errors.
  - E-mail notification of printer errors to specified addresses.
  - Universal Plug and Play (UPnP).
  - FTP download allows users to upgrade the interface's Flash memory.

- ***DMXrfNet*** – a high-performance 802.11b, WiFi compatible, network interface card that enables the printer to communicate in a wireless network environment. Some of the features are listed below:
  - TCP/IP (lpd or raw TCP port), Direct Mode IPX/IP, IPX/SPX, NetBEUI, and NetBIOS/IP support
  - A PCMCIA connector for other supported 802.11b wireless devices
  - Variable data rates of 11, 5.5, 2, and 1 Mbps
  - Frequency in the 2.4 GHz ISM band
  - Selectable Wired Equivalent Privacy
  - Sensitivity of -91dBm at 1Mbps, -88dBm at 2Mbps, -87dBm at 5.5 Mbps, and - 84dBm at 11 Mbps
  - Range of 100m indoors and 300m outdoors
  - Industry standard MMCX diversity antenna connectors
  - Hot swappable 10baseT Ethernet port for wired connections
  - RS-232 compatible serial port with selectable baud rates to 230.4Kbps.
  - Datamax Web XAdmin web-browser facility including English, German, French, and Dutch multilingual capability
  - Datamax XAdmin NetWare/VINES/TCP/IP Windows-based utility
  - Console accessible via serial port, TELNET or NetWare
  - NetWare PCONSOLE, PRINTCON, PRINTDEF, NWADMIN
  - Simple Network Management Protocol MIB I and II; IP or IPX
  - Multiple server firmware downloads via NetWare or TCP/IP (master mode tftp, slave mode TFTP, or BOOTP)
  - On-line Help guide
  - Multiple services per port
  - `lpd`-Plus virtual printer capability for complex user-defined setup and reset strings configurable on a per-service basis
  - Programmable character string conversion
  - IP security allows access restriction to the Card based on IP addresses.
  - Configurable TCP port numbers on a per-service basis
  - IP address configuration via serial port, arp, rarp, DHCP, BOOTP, Xadmin & WP-Admin utility, JetAdmin/Web JetAdmin, and NetWare
  - Automatic detection of NetWare frame type, or frame type can be forced
  - Diagnostics including protocol trace capability and crash dump

- ***Expanded Flash Main Card*** – an alternate main logic card with 8MB of Flash memory expansion for International Language Printing Capability (ILPC) and/or additional fonts and graphics. ILPC consists of <u>one</u> of the following:
  - CG-Times™ (European) Scaleable font
  - CG Times™ Scaleable bold condensed font (supporting the Enhanced Language Code Pages)
  - Kanji Gothic B Scaleable font
  - Simplified Chinese GB Scaleable font
  - Korean Hangul Scaleable font

- ***MCL*** – A software tool suite designed for data collection applications. Once enabled, the printer can accept input data from peripheral devices such as barcode scanners, weigh scales, and keyboards without the need of a host computer, requesting and sending data to locally resident lookup files or remote databases, enhancing communication capabilities within your system while reducing your hardware investment.

- ***Thermal Transfer –*** A printing method that uses ribbon to produce exceptional image clarity (as compared to most direct thermal media types). At time of order, this option must be specified for use with either 'coated side in' ribbon or 'coated side out' ribbon.

- ***Twinax/Coax Interface*** – A slide-in circuit card that provides connectivity to an AS/400 and System/3X Twinax host system or a 3270-type host system. Cable included.

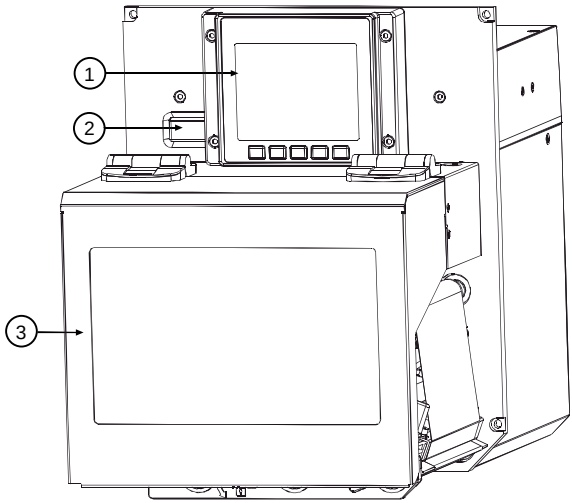
1.2 Installing Printer Options

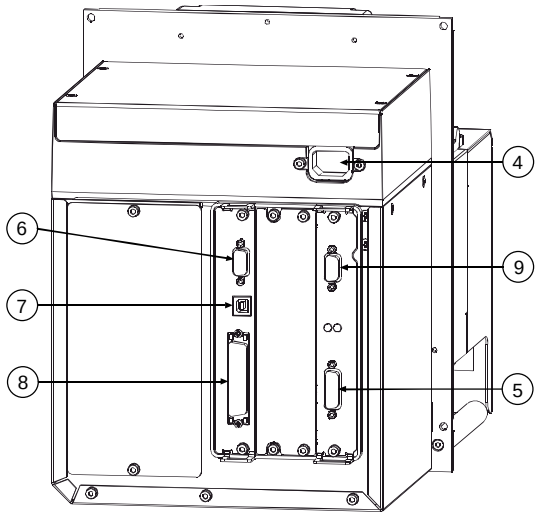
The following table lists the available options and the qualification level of the installer. For detailed information concerning a specific option or qualification level, contact your dealer or Datamax Technical Support.

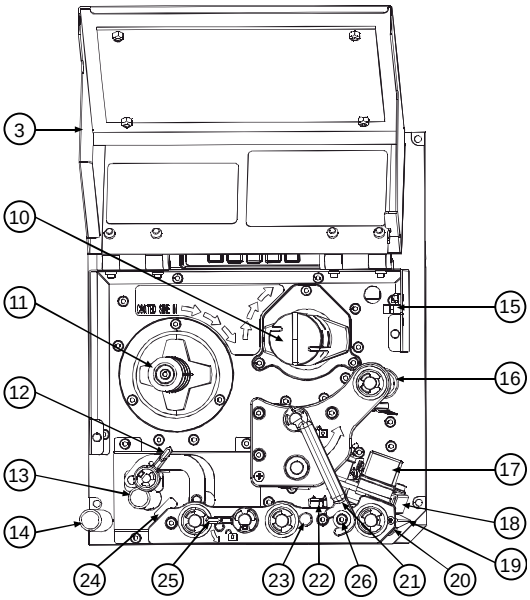
Required Experience Level for Options Installation	
Option	**Installer**
DMX 100	DMX Certified Technician
DMXNet	DMX Certified Technician
DMXrfNet	DMX Certified Technician
MCL	DMX Certified Technician
Expanded Flash Main Card	DMX Certified Technician
Ribbon Saver	Factory Only
Thermal Transfer	DMX Certified Technician
Twinax/Coax Interface	DMX Certified Technician

1.3 Index to Parts and Controls

The following illustrations highlight the printer's user-assessable components. Note that some components are optional and therefore may not be on your model. Also, depending upon the optional configuration, the position of the items illustrated below may be mirrored on your printer.



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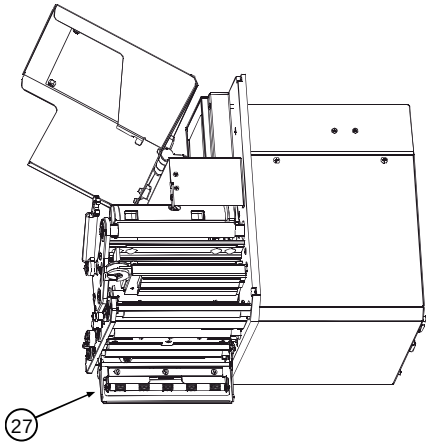

27

Item Number	Item Description and Related Section in this Manual
1	User Interface, Section 4
2	Power On/Off Switch, Section 3.3
3	Access Cover, Section 2.1
4	Power Receptacle, Section 3.3.4
5	GPIO Port, Section 3.3.2
6	Serial Communications Port, Section 3.3.1
7	Universal Serial Bus Communications Port, Section 3.3.1
8	Parallel Communications Port, Section 3.3.1
9	Aux Serial (Serial Port B), Section 3.3.1
10	Ribbon Take-Up Hub, Section 3.5*
11	Ribbon Supply Hub, Section 3.5*
12	Pinch Roller Lever 3.4*
13	Upper Media Post, Section 3.4
14	Lower Media Post, Section 3.4
15	Cover Sensor, Section 6.2
16	Upper (Ribbon) Idler, Section 3.5
17	Leveling Cam, Section 5.2.1
18	Printhead Assembly, Section 5.2.2
19	Peel Bar, Section 3.4
20	Platen Roller, Section 5.4.2
21	Head Lift Lever, Section 3.4
22	Media Sensor, Section 3.6
23	Media Sensor Adjustment Knob, Section 3.6
24	Media Guide, Section 3.4
25	Peel Assembly Release Lever, Section 3.4
26	Locking Post, Section 3.4
27	Peel Assembly, Section 3.4

*Optional feature

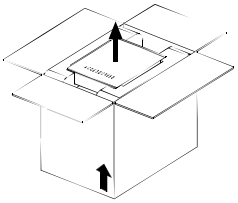
Getting Started

This section describes printer unpacking and installation.

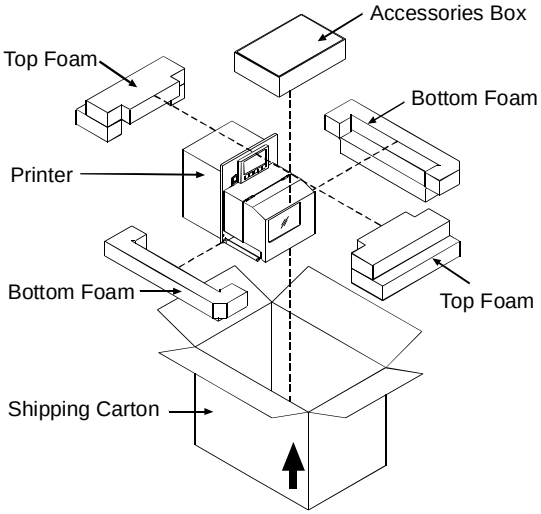
2.1 Unpacking the Printer

Upon arrival, inspect the shipping carton(s) for damage; if evident, immediately report the nature and extent of the damage to the freight company.

The printer has been carefully packaged for transit. In order to operate the printer, you will need to remove all packaging material:

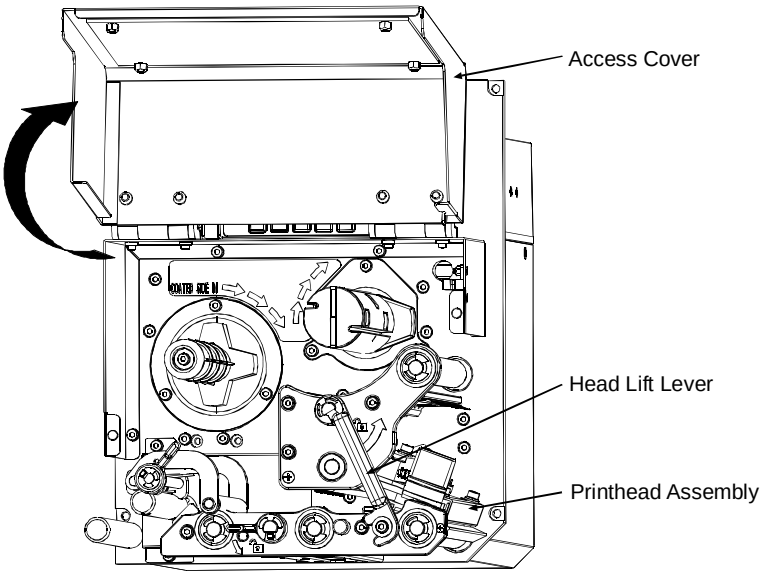


1. With the box orientation arrow pointing upward, open the Shipping Carton.
2. Remove the Top Foams and the Accessories Box.
3. Lift the Printer out of the Shipping Carton.
4. Carefully place the Printer on a solid surface and remove it from the plastic bag.



5. Open the Access Cover and remove the tape and packing material from the Printhead Assembly.

6. Lower the Head Lift Lever and close the Access Cover.

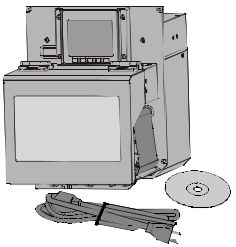


☑ ***Note:*** *It is a good idea to save the carton and packaging materials in the event that future shipment is required.*

2.1.1 Inspection

After unpacking printer, check the contents of the package. In addition to this documentation, the following items should be present:

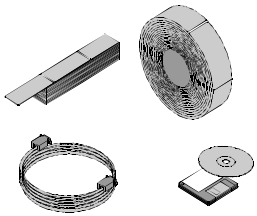
- Printer
- Power Cord
- Accessories CD-ROM
- Any special or additionally purchased items.



2.1.2 Additional Requirements

The following items are necessary to produce labels.

- An interface cable; see Section 3.3.1
- An applicator cable; see Section 3.3.2
- Applicable media; see Section 2.2
- Labeling software



2.2 Selecting Media and Ribbon

The following is an overview of media characteristics. For complete information regarding your specific application needs, always consult a qualified media specialist or a Datamax Media Representative.

Media Selection – Direct Thermal

Consider three important factors when selecting direct thermal stock:

- The abrasive qualities of the material that covers the thermal reactive layer of the paper.
- The ability of the thermal reactive layer to control the chemical reaction that occurs when the image is burned (created) onto the media.
- The amount of heat required to create an image on the paper.

Media Selection – Thermal Transfer

Consider three important factors when selecting thermal transfer media combinations:

- The combination of label top coatings and ribbons can affect image quality.
- The backcoating on the ribbon can provide printhead protection and, depending upon the formula, can help reduce static build-up.
- The use of a ribbon with a slightly greater width than that of the label (and backing material) can help protect the printhead.

2.2.1 Print Quality

Printing flexibility is provided by a comprehensive set of print controls. Of these, the amount of printhead heat applied and the rate of media movement will have the greatest effect on your printed text, logos and barcodes. Four settings can be used to control print quality; all are accessible via the menu system:

- The first setting is the media type. Go to `MEDIA SETTINGS → MEDIA TYPE` (see Section 4.2.2) and select the setting that that matches the media being used.

- The second setting is the heat value. Go to `PRINT CONTROL → HEAT` (see Section 4.2.3) and increase this value to darken the image, or reduce this value to lighten the image.

  ☑ ***Note:*** *Heat values received by host software commands (selectable as 'Heat Setting' in most labeling programs) may override the printer's menu setting.*

- The third setting is the speed value. Go to `PRINT CONTROL → PRINT SPEED` (see Section 4.2.3) and change the amount of time that the label remains under the printhead. Slower settings allow more time and control for energy transfer, while faster settings increase throughput, but may require higher heat settings to achieve the desired darkness.

  ☑ ***Note:*** *Speed values received by host software commands (selectable as 'Print Speed' in most labeling programs) may override the printer's menu setting.*

- The final setting is the contrast value. Go to `PRINT CONTROL → CUSTOM ADJUSTMENTS → CONTRAST` (see Section 4.2.3). This is a fine-tuning adjustment, predominately affecting the gray (shaded) areas of the image.

Printing bar codes or detailed images on inexpensive direct thermal and thermal transfer media can be tricky. For example, low-cost direct thermal stocks have raised reaction temperatures and therefore require higher heat values or slower speeds to print a clear image. In many cases, to print detailed images at high speeds, media with a low reaction or release temperature is required. The resulting crisp images are possible because the media is not stretched beyond its limits.

The following table is intended for reference only; for specific application information, consult with your media specialist or a Datamax Media Representative.

Direct Thermal Media	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
Thermal Transfer Media				
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

*Speeds given in inches per second

**Highly recommended for optimum quality at print speeds above 10 IPS.

Printer Setup

This chapter explains how to mount, connect, and setup the printer.

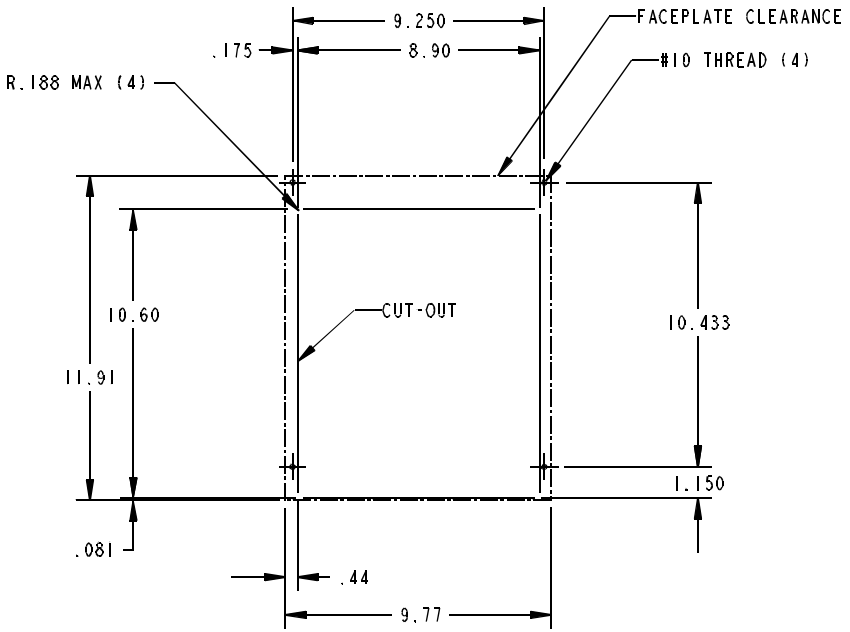
3.1 Environmental Requirements

Before installing the printer, ensure that the ambient environmental conditions of the site fall within the ranges listed in Section 7. In addition, do not install the printer in the following environments:

- Where it will be exposed to direct sunlight or other heat source.
- Where it will be exposed to liquids or excessive dust or dirt.

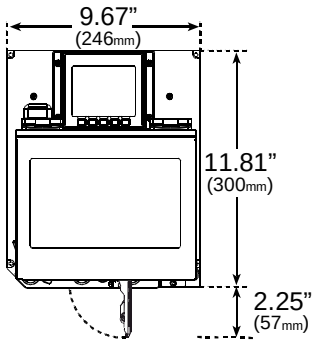
3.2 Mounting the Printer

The template below details the cutout dimensions and hole locations required to place the printer within an applicator's support structure:

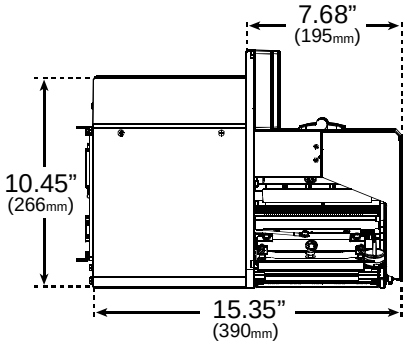


When mounting the printer into an applicator, include enough clearance to allow the Access Cover and Peel Assembly to be opened. Also allow enough space for the power and interface connectors on the back of the printer. Use the following illustrations as a reference.

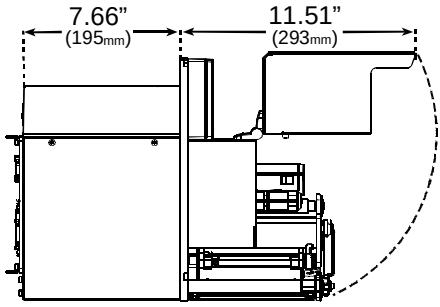
Front View, Peel Assembly Lowered:



Side View:



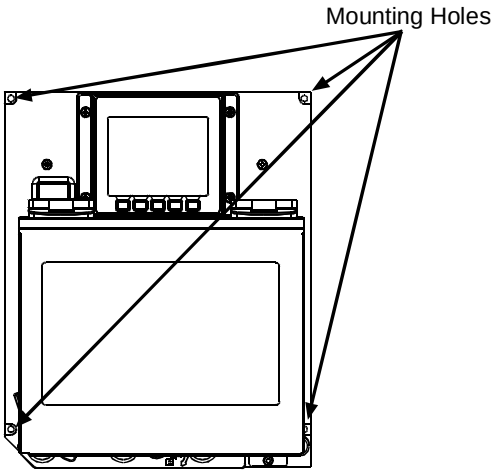
Side View, Access Cover Raised:



Attach the printer to a supporting framework using #10 screws inserted at the four pre-drilled and countered Mounting Holes in the printer's centerplate. Depending upon your printer model, refer to illustrations below for the various dimensions, space requirements, and mounting points.

Mount the printer as follows:

1. Align the printer's Mounting Holes to the corresponding points in the supporting framework of the applicator.



2. Hold the printer in place and insert a #10 screw in a mounting hole.

3. Start and finger-tighten the screw.

4. Start and finger-tighten the screws for the three remaining mounting holes.

5. Completely tighten all four the screws.

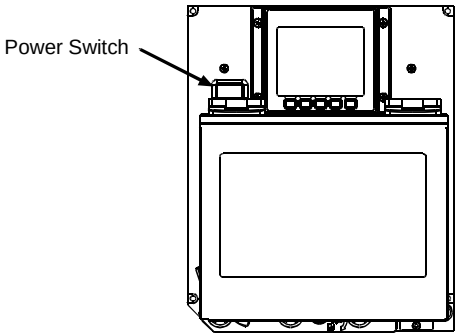
3.3 Connecting the Printer

☑ ***Note:*** *When connecting any interface cable, ensure that AC power is 'Off' and always power-up the Host Computer before the Printer.*

Make electrical connections to the printer as follows:

1. Ensure that AC power to the Host Computer and applicator system is 'Off'.

2. Ensure that the printer's Power Switch is in the 'Off' position.



3. Connect the appropriate communications cable from the Host to the printer; see Section 3.3.1.

4. If additional serial communications are needed, connect a serial cable from the Host to the Aux Serial (J1) on the Applicator Interface Card; see Section 3.3.1.

5. See Section 3.3.2 for details regarding the applicator cable connection to the GPIO Port.

WARNING *Failure to properly configure the GPIO Port may result in damage to the printer and / or the applicator.*

6. Connect the AC Power Cord to the printer, and then plug the AC Power Cord into a properly grounded outlet; see Section 3.3.4.

7. Turn 'On' the Host Computer, the applicator system, and then the printer.

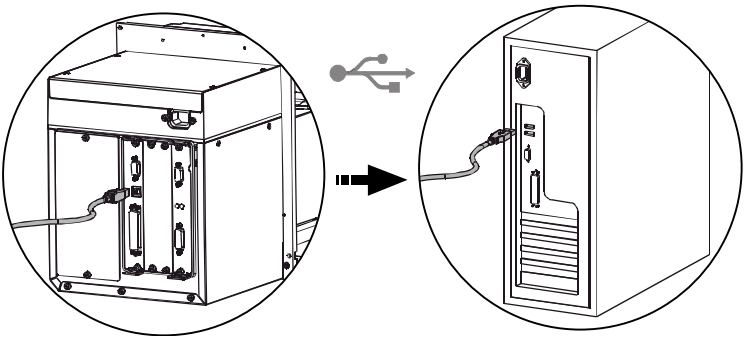
3.3.1 Communications Connections

The standard printer can be interfaced to a host via serial, USB, and parallel connections. The printer will automatically establish communications through the first port that receives valid data. Once established, the timeout period (see Section 4.2.6) must be exceeded or the printer's power must be cycled 'Off' and 'On' to change the interface connection.

☑ ***Note:*** *Depending upon the configuration of your printer, the location of the following communications connections can vary.*

USB Connections

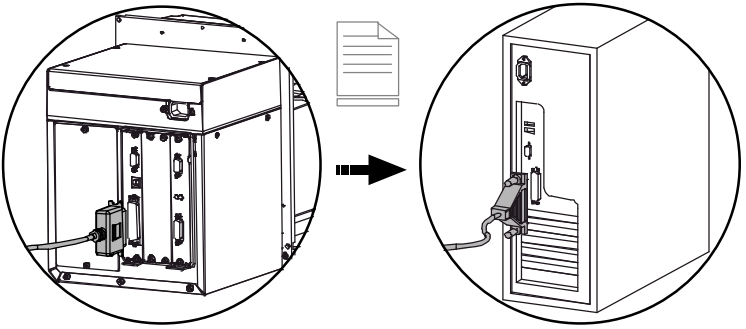
The Universal Serial Bus, supported in Windows®95 and greater, requires a standard USB cable. (Depending upon your computer's configuration, installation may differ slightly.)



WARNING *The USB Port is a device-end only connection. Never attach a keyboard, mouse, modem, etc. to this port. Damage can result.*

Parallel Port Connections

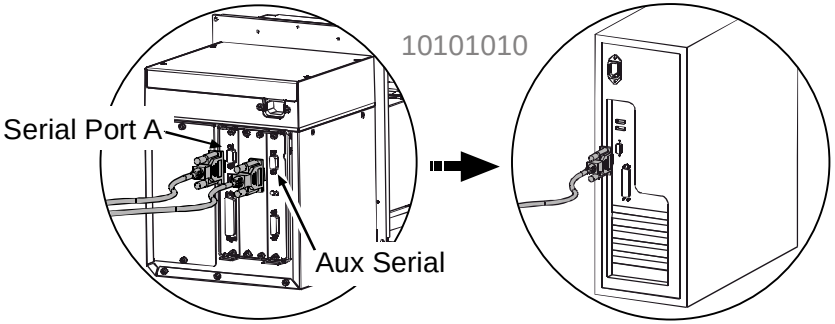
The parallel interface requires a Centronics® IEEE 1284 cable with a 36 pin male connector. Bi-directional mode is IEEE 1284 Compliant, using forward and reverse channel communications. In this mode, data can be sent to the host provided it is also IEEE 1284 Compliant and has supporting software.



Serial Port Connections

The serial interface (Serial Port A) on the main logic card supports RS-232C and RS-422/RS-485 communications. The Aux Serial, J1 on the Applicator Interface Card, supports RS-232C only (see Appendix D for details).

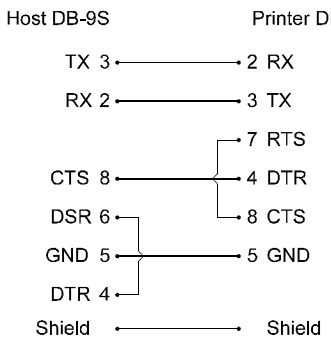
Serial port settings for baud rate, word length, word parity, stop bits, and handshaking protocol are menu-selectable and must be configured to match the host's port settings; see Section 4.2.6.



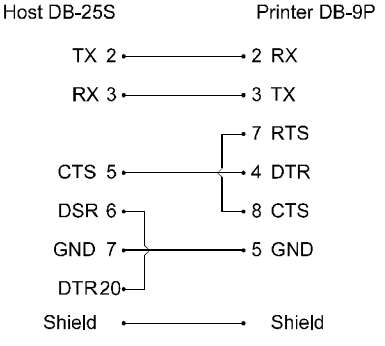
The available serial cables and part numbers are shown below. **For proper data exchange, the serial interface cable requires specific pin-outs (see diagram).** Contact a reseller for ordering information.

	RS-232	RS-422/485
Pin Number	**Function**	**Function**
1	+5V (@ .5 amps)	---
2	RX	RXD+
3	TX	TXD-
4	DTR	RXD-
5	Ground	Ground
6	---	---
7	RTS	RTS
8	CTS	CTS
9	---	TXD+

RS-232 Cables*

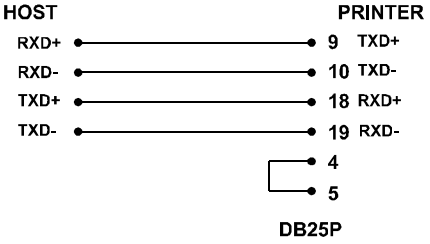


Part # 32-2300-01



Part # 32-2301-01

RS-422/485 Cables*



(Diagram above is provided only provided as a reference.)

*The serial ports require a DB9 male connector (e.g., Startech C9PSM).

Configuring for RS-422/485 Communications

To use RS-422/485 communications, jumpers must be removed from the main logic card. Follow the procedure below:

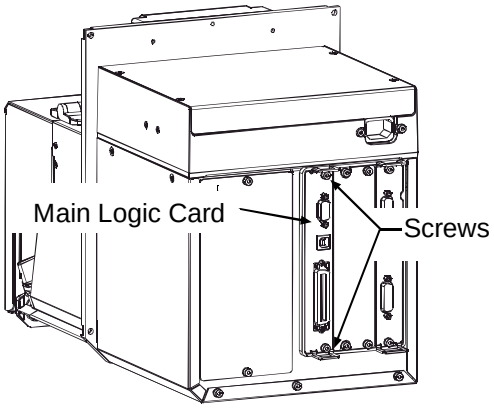
CAUTION *Always wear a wrist strap and follow standard ESD prevention measures when handling the Main Logic Card.*

1. Turn 'Off' the power switch and unplug the AC Power Cord from the printer.

2. Remove any interface cable(s) already attached to the Main Logic Card.

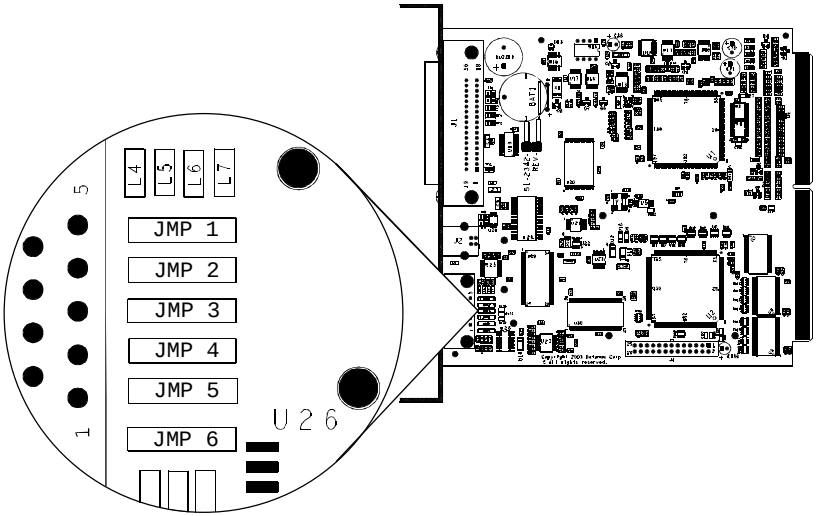
   ☑ ***Note:*** *Depending upon the configuration of your printer, the location of the Main Logic Card can vary.*

3. Remove the two Screws securing the Main Logic Card to the printer.



4. Slide the Main Logic Card from the printer and place the card on a static free work area.

5. Remove the Jumpers JMP1, JMP2, JMP3, JMP4, JMP5, and JMP6 from the Main Logic Card.

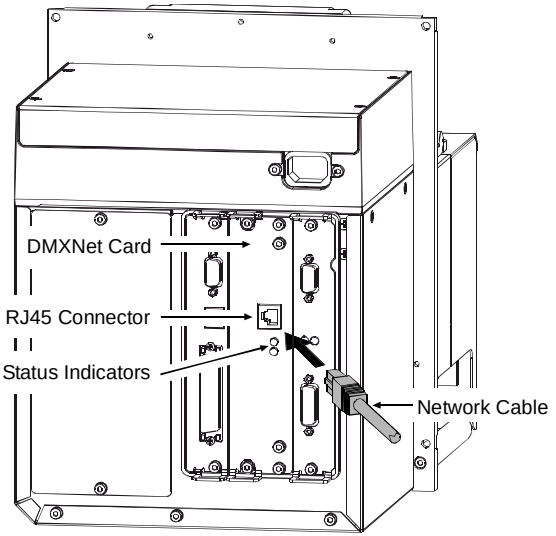


6. Slide the Main Logic Card back into the printer and secure it using the screws removed earlier.

7. Connect an RS-422/485 interface cable to the Serial Port A. Plug in and turn 'On' the printer. Configure the port communication settings to match that of the host (see Section 4.2.6).

DMXNet Connections

The DMXNet option has several menu-selectable modes, as detailed under 'NIC ADAPTER' in Section 4.2.6. For detailed installation, configuration, and operational instructions, refer to the *DMXNet Resource Manual*, provided with the option.



Use the following universal Ethernet 8-wire standard when configuring your 10/100BaseT cables for the DMXNet Card. Depending on the length, the cable should be Category/Type 3 or better.

RJ45 Pin Number	Color	Ethernet
1	Brown	Transmit +
2	Brown/white	Transmit –
3	Orange	Receive +
4	Green	–
5	Green/white	–
6	Orange/white	Receive –
8	Blue/white	–
7	Blue	–
8	Blue/white	–

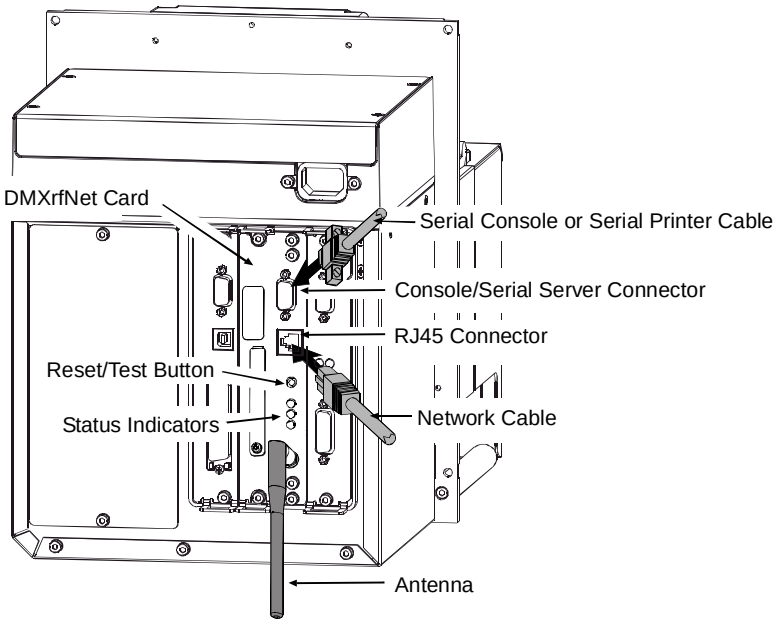
The Status Indicators (LEDs), viewable from the back of the printer, provide a quick operational check of the interface, as defined below:

☑ ***Note:*** *After power-up, wait until 'DMXNET INITIALIZING' is no longer displayed (about two minutes) before proceeding.*

Status Indicator	Normal Conditions	Other Conditions
Green	Upon power-up, this LED is 'On' to indicate that the card is performing self-tests, afterward the LED flashes and may flash again as soon as the printer's initialization is complete. This LED may also be 'On' when awaiting a print job.	1 to 7 blinks of the Amber LED followed by 1 to 12 blinks of the Green LED indicates a hardware failure.
Amber	Generally indicates job activity. When receiving print jobs over the network, the LED flashes; it remains 'Off' during inactivity.	

DMXrfNet Connections

The DMXrfNet option has several menu-selectable modes, as detailed under '`NIC ADAPTER`' in Section 4.2.6. Depending upon the method you select to configure the DMXrfNet card, you may need a hard wire connection. In addition, a hard wire connection is necessary if you plan to use the 10 BaseT port or the Serial Server in your application. The drawing below illustrates the available mode-dependant connections to the DMXrfNet Card. For detailed installation, configuration, and operational instructions, refer to the *DMXrfNet Resource Manual*, provided with the option.



Status Indicators	Normal Conditions
Wireless	This red indicator initially comes 'On' and then cycles 'Off' when power is applied to the printer. Thereafter, 'On' denotes that a wireless link is established.
ACT/Err	This green indicator blinks during network activity.
LNK	This yellow indicator initially comes 'On' and then goes Off' when power is applied to the printer. Thereafter, 'On' denotes that a 10 BaseT Ethernet connection is established.

☑ ***Note:*** *If there is no visible LED activity, check to insure that the printer's Application Version is at 07.132 or greater.*

The Reset/Test Button is a multi-function switch with the following functions:

(1) When pressed momentarily, this produces a printout of the DMXrfNet Card's current settings.

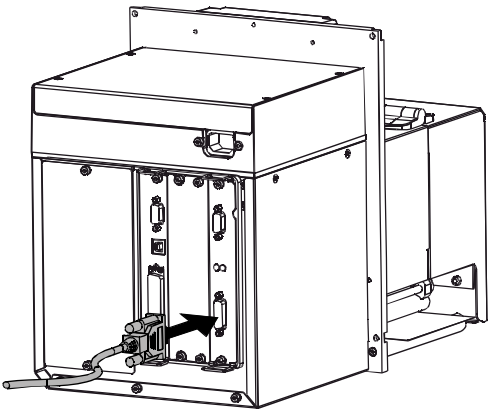
(2) When pressed and held for five seconds, this resets the DMXrfNet Card to the factory default parameters. (The default password is **`access`**)

(3) When pressed and held during printer power-up, this causes the DMXrfNet Card to assume Ad-Hoc mode on WiFi Channel 11 with the Service Set Identifier (SSID) of **`printer`**. (This also restores Console mode.)

3.3.2 Applicator Connections

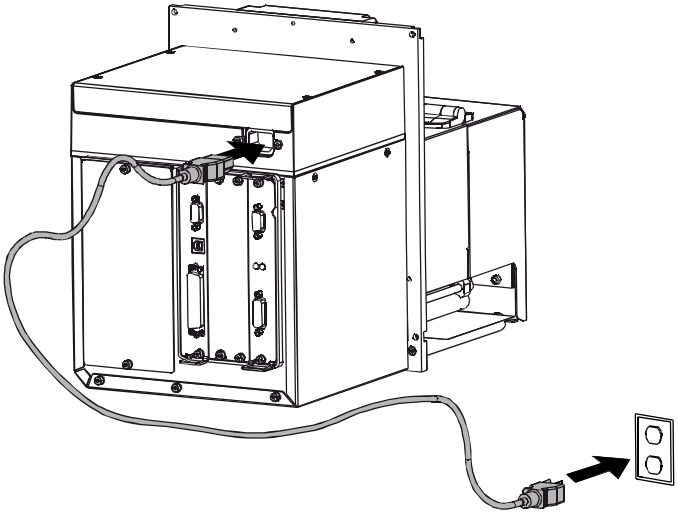
After setting up the GPIO Port per the instructions found in Appendix D, connect the printer to the GPIO Port (J2) on the Applicator Interface Card:

WARNING *Failure to properly configure the GPIO Port may result in damage to the printer and / or the applicator.*



3.3.3 Power Connections

The AC power connection is made via the receptacle on the back of the printer. The printer's power supply is auto ranging; for acceptable voltage ranges, see Section 7.



3.4 Loading Media

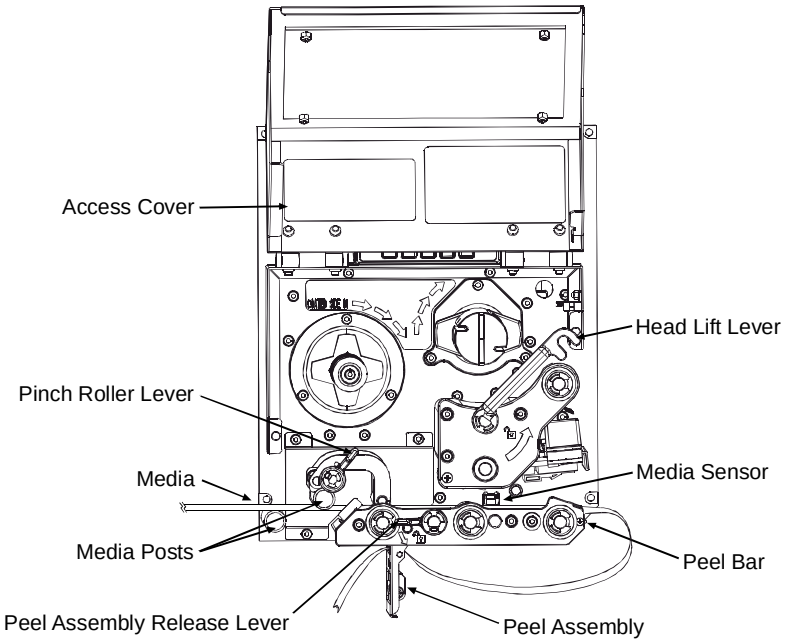
WARNING *While in operation, hazardous moving parts are present. Always keep body parts, loose clothing, etc. away from this mechanism.*

Load media into the printer as follows:

1. Open the Access Cover and raise the Head Lift Lever. (If equipped, raise the Pinch Roller Lever.)

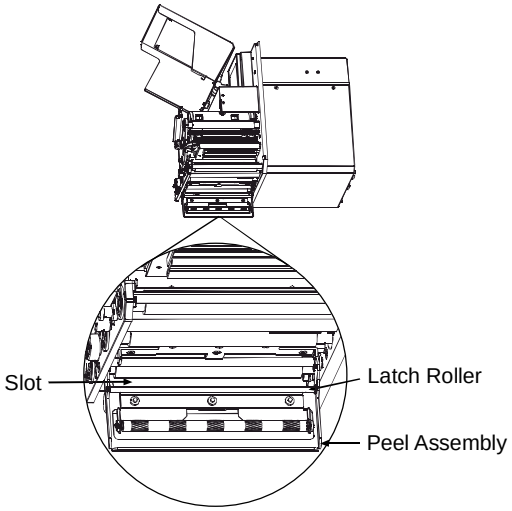
2. Bring the Media into the printer between the Media Posts.

3. Route the Media through the Media Sensor and over the Peel Bar, as shown below.



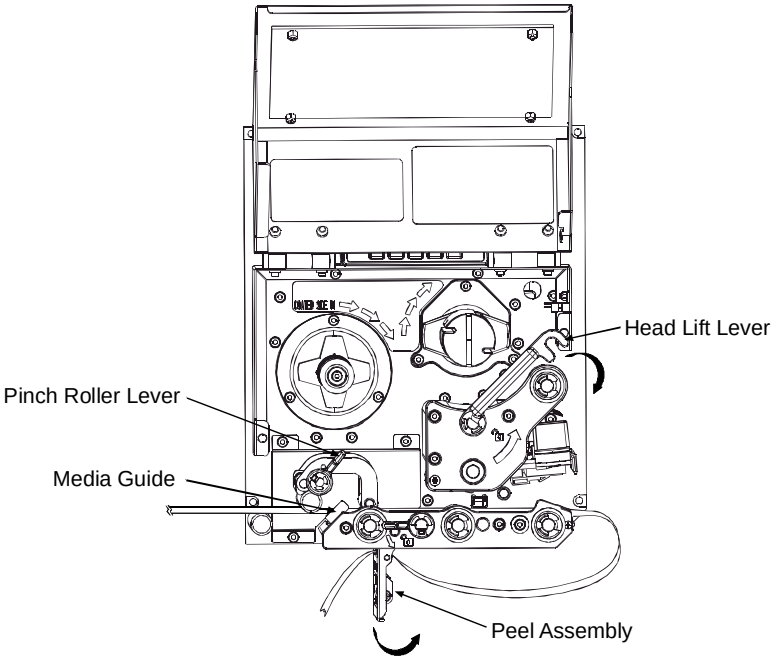
4. To automatically peel die-cut media, press down on the Peel Assembly Release Lever to lower the Peel Assembly.

5. From the Peel Bar forward, remove the labels from the liner material then route the liner material down to the Peel Assembly, over the Latch Roller, and through the Slot.



6. Continue routing liner material through the slot until all slack is removed.

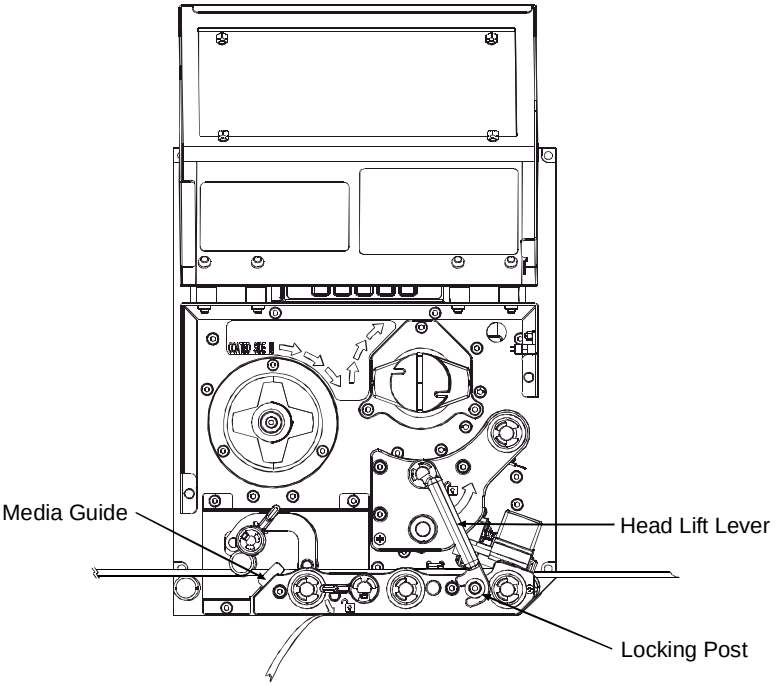
7. Raise the Peel Assembly until it locks into place. (If equipped, lower the Pinch Roller Lever.)



8. Position the Media Guide lightly against the side of the media.

9. If printing on thermal transfer media, load ribbon (see Section 3.5).

10. Lower the Head Lift Lever completely onto the Locking Post. This is the locked position. Adjust the Media Sensor (see Section 3.6) and Leveling Cam (see Section 5.2.1). Perform a Quick Calibration (see Section 5.1.1).



3.5 Loading Ribbon

> *Always use ribbon that is slightly wider than the media (and liner, if any) to protect against printhead wear. Ribbon types are available with the coated (ink) layer wound 'in' or 'out.' These are NOT interchangeable for use with the printer.*

To print with thermal transfer media, ribbon is required. The Ribbon Hub configuration will determine the ribbon type (ink wound 'in' or 'out') that can be used in the printer. The directional arrows on the Ribbon Routing Label indicate the way to route the ribbon through the printer.

Load ribbon into the printer as follows:

1. With the access cover open and the Head Lift Lever raised, position a ribbon to be dispensed in the direction appropriate for the Ribbon Supply Hub, as indicated in the figures below.

2. Slide a roll of ribbon on the Ribbon Supply Hub until it rests against the hub's flange.

3. Route the ribbon under the Lower Idler, out the front of the printer, over the Ribbon Shield and Upper Idler, then up around to the Ribbon Take-Up Hub.

4. Use a small piece of tape to attach the ribbon to the Ribbon Supply Hub then turn the hub several times to secure the ribbon.

5. Lower the Head Lift Lever back into the locked position. Close the access cover.

3.5.1 Removing Ribbon

When the ribbon supply is exhausted, grasp the used ribbon on the Ribbon Take-Up Hub, then while pulling outward, squeeze together the collapsible hub and pull off the ribbon. Next, pull the empty core from the Ribbon Supply Hub and discard it.

‘Coated Side In’ Ribbon Routing Diagrams

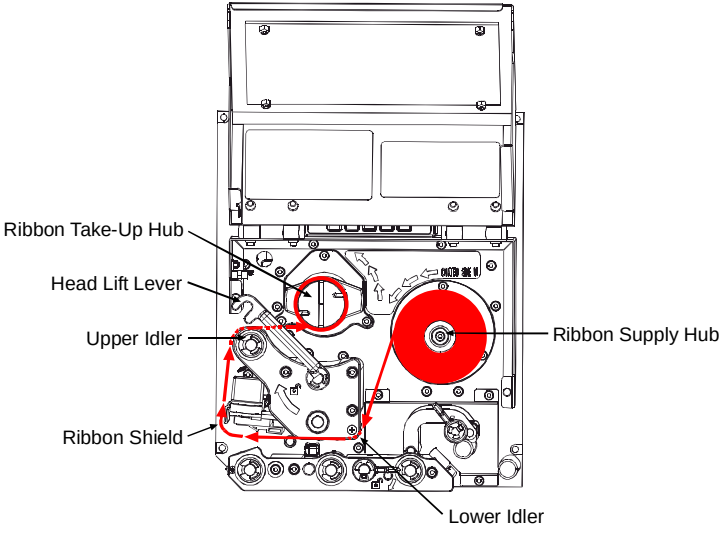


Figure 3.4: Left-Hand Model

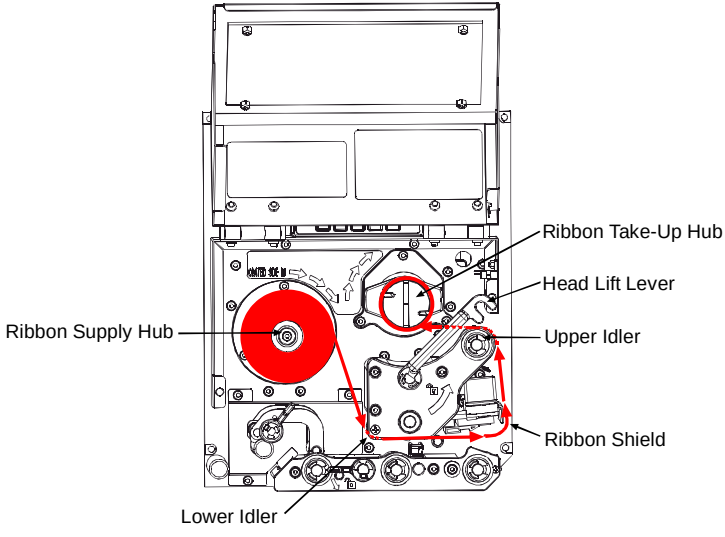


Figure 3.5: Right-Hand Model

‘Coated Side Out’ Ribbon Routing Diagrams	

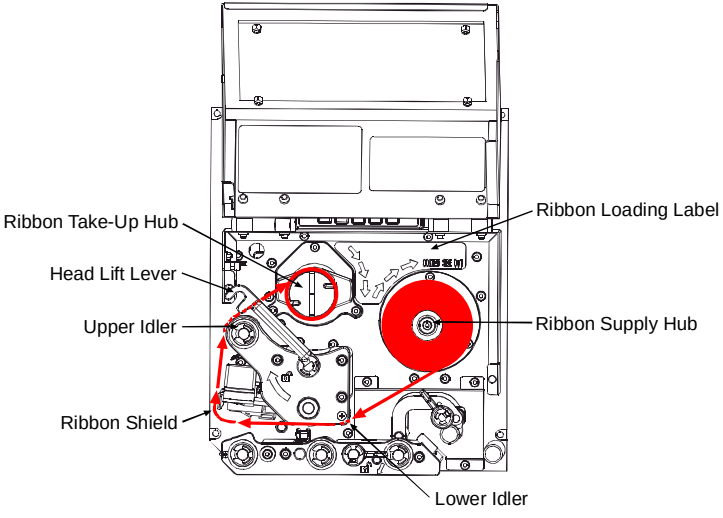
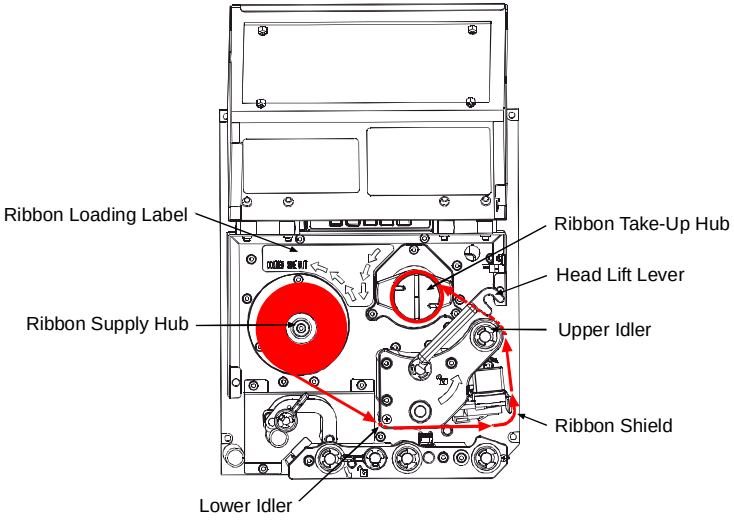

	

Figure 3.6: Left-Hand Model	**Figure 3.7: Right-Hand Model**

3.6 Media Sensor Adjustment

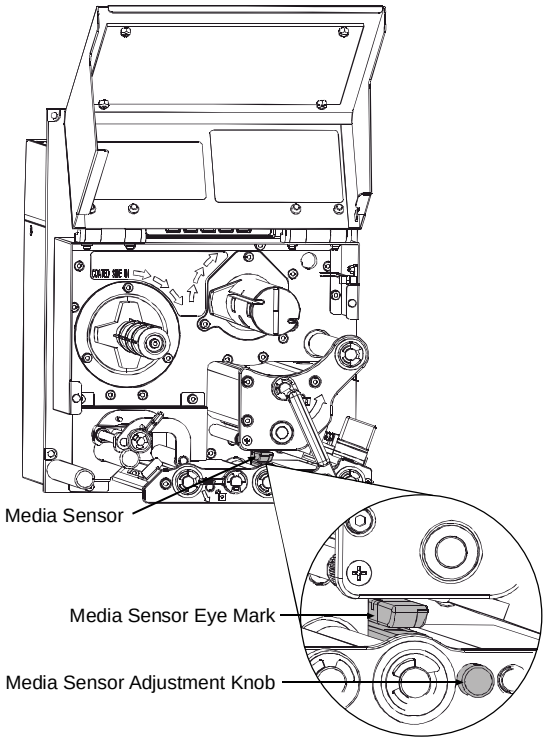
The Media Sensor detects the presence of media and the Top-Of-Form marks on the media. Position the Media Sensor as follows:

1. Load media (see Section 3.4).

2. Turn the Media Sensor Adjustment Knob to position the Sensor Eye Mark over the media, according to the table below.

Media Sensor Selection and Adjustment		
Media Type	**Sensor Eye Mark Position**	**Sensing Required**
Die-cut	Near the middle of the label	Gap
Notched	Centered over the notch	Gap
Reflective	Centered over the black mark	Reflective
Continuous	Near the middle of the media	Continuous**

*See Section 4.2.2 for Sensor Type selection.
** See Section 4.2.2 for Label Length setting.



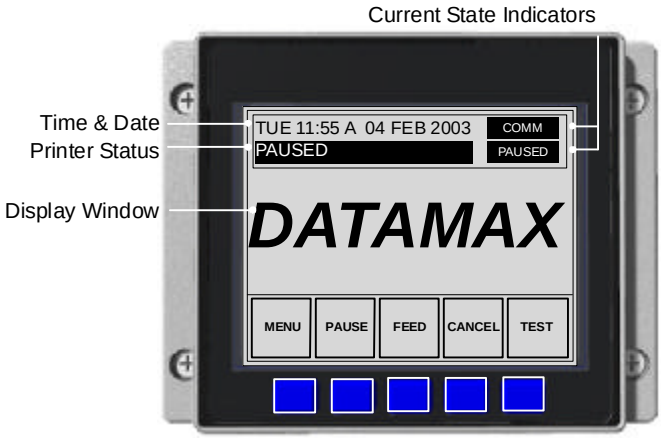
☑ ***Note:*** *Changes to the start of print position can be made using* `Print Control` → `Row Offset` *or* `Custom Adjustments` → `Row Adjust` *(see Section 4.2.3).*

4 The User Interface

The user interface is comprised of a graphic display and soft-function keys. The operation is mode-dependant, so depending upon your selections the displayed items and key functions of the interface can change. All of the various modes are detailed in this section.

4.1 User Interface Functions

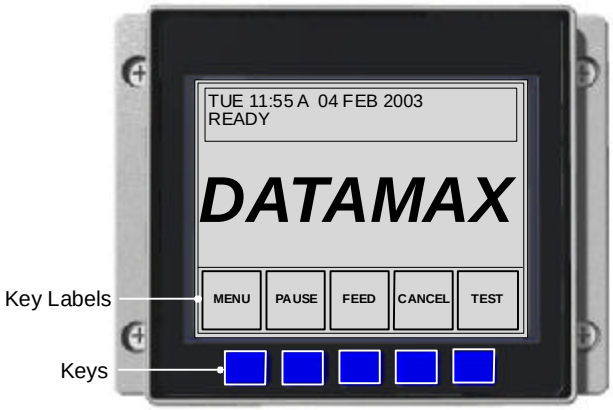
The graphic display is a window into printer operations, displaying the following information:



Indicator	Indicator Item and Function
Current State	Provides two types of information: ➢ COMM indicates data is being received and processed. ➢ PAUSE indicates the printer is in a 'Paused' condition.
Time & Date	The current settings for Time and Date.
Printer Status	Following initialization, the 'Ready' message and a label counter during a batch print job, but also any prompt, condition, warning, or fault message.
Display Window	Provides several types of information: ➢ A start-up graphic (see the *Class Series Programmer's Manual* for downloading details). ➢ The Menu Window when in Menu Mode. ➢ The Test Window when in Test Mode. ➢ The FAULT message during a printer fault condition.

4.1.1 Ready Mode

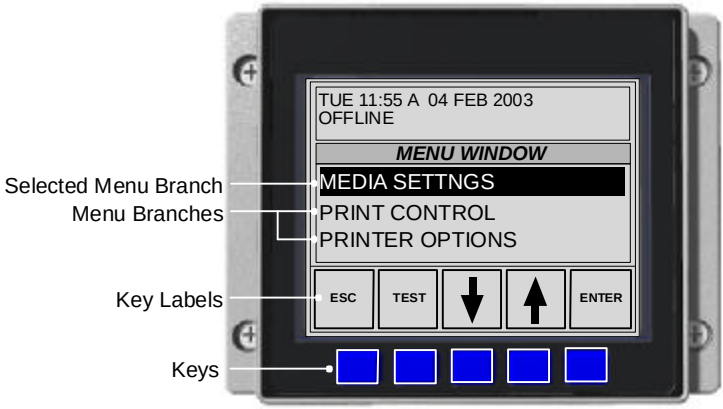
In Ready Mode, the printer is idle, waiting to accept data for label printing.



Key Label	Key and Function
MENU	The MENU Key takes the printer Offline and enters Menu Mode. (When shaded, this denotes that security is enabled and now a password must be entered. See Section 4.2.1.) ☑ **Note:** While in Ready Mode, pressing and holding this key will adjust the display contrast. It can take up to fifteen seconds to cycle through the entire contrast range.
PAUSE	The PAUSE Key temporarily suspends printing, as noted by the Current State Indicators. Pressing the key again will return the printer to normal operation.
FEED	The FEED Key advances one label, and clears any corrected faults. Also, pressing and holding this key causes the printer to perform a Quick Media Calibration; see Section 5.5.1.
CANCEL	The CANCEL Key 'pauses' the printer and then prompts you for confirmation. If yes, the current job is cancelled. The printer remains paused. Also, pressing and holding this key four seconds will reset the printer and clear temporary host settings; see Section 6.4.1.
TEST	The TEST Key enters the Test Mode; see Section 4.1.3. Pressing and holding this key evokes the printhead cleaning routine; see Section 5.4.1. (When missing, this denotes that security has been enabled; a password must be input to proceed. See Section 4.2.1.)

4.1.2 Menu Mode

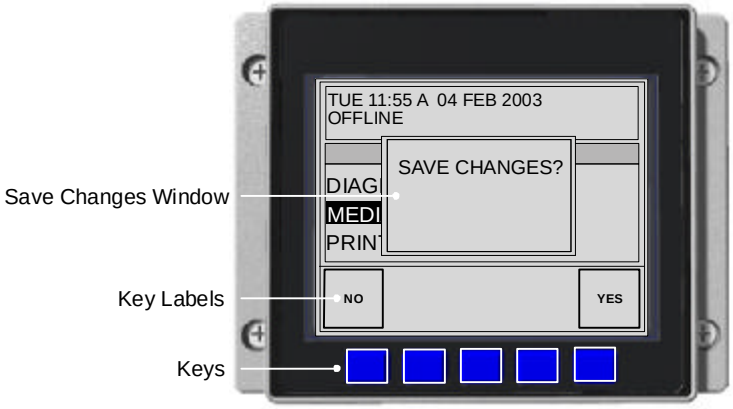
In Menu Mode, the Menu Window appears, as shown below. This mode allows the printer to be configured for your application. Note that the Selected Menu Branch appears highlighted in a reverse field on the Menu Window.



Key Label	Key and Function
ESC	The ESCAPE Key exits the Selected Menu Branch. Repeatedly pressing the key exits Menu Mode and returns the printer to Ready Mode.
TEST	The TEST Key enters the Test Mode; see Section 4.1.3. Pressing and holding this key causes the printer to perform a printhead cleaning; see Section 5.4.1.
↓	The DOWN ARROW Key selects the previous Menu Branch. (Not all branches appear in the Menu Window at any one time.)
↑	The UP ARROW Key selects the next Menu Branch. (Not all branches appear in the Menu Window at any one time.)
ENTER	The ENTER Key enters the Selected Menu Branch.

4.1.2.1 Menu Mode Save Changes Window

The Save Changes Window is a Menu Mode exit prompt (see Section 4.2.1). It allows changed made within the Menu System to be saved or discarded.

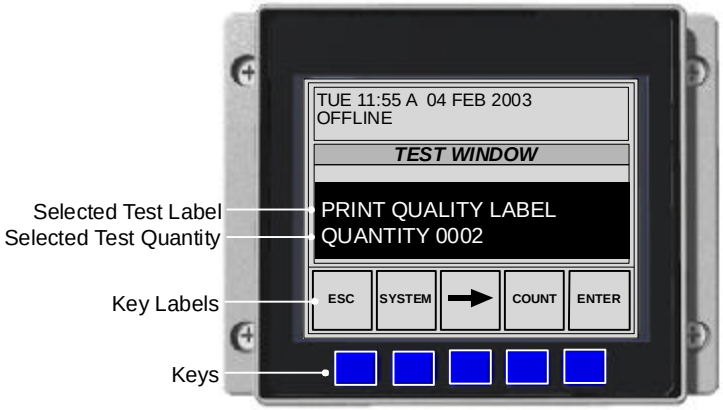


Key Label	Key and Function
NO	The NO Key exits Menu Mode without saving the changes that have been made to the printer's operating parameters.
YES	The YES Key saves the changes that have been made to the printer's operating parameters and then exits Menu Mode.

4.1.3 Test Mode

In Test Mode, the Test Window appears. Test Mode allows various sample and informational labels to be printer.

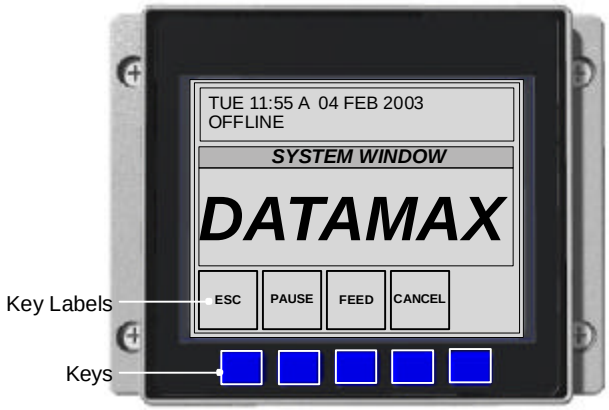
> ☑ ***Note:*** *Test functions are disabled when the printer is processing data received from a communications port. Also, when 'SECURITY' is enabled this function is not accessible until the correct password is input.*



Key Label	Key and Function
ESC	The ESCAPE Key exits Test Mode and returns to Menu Mode.
SYSTEM	The SYSTEM Key evokes a System Window with the following functions: ESC, PAUSE, FEED, and CANCEL; see Section 4.1.3.1.
→	The RIGHT ARROW Key changes the Selected Test Label; see Section 4.4.
COUNT	The COUNT Key changes the Selected Test Quantity of labels in the following amounts: 1, 10, 100, 1000, and 9999 (except the 'Configuration Label', which is always one). Pressing and holding this key scrolls quantities.
ENTER	The ENTER Key will print the Selected Test Label at the Selected Test Quantity.
	☞ *A printing time delay can be specified for this function using 'Print Test Rate'; see Section 4.2.7.*

4.1.3.1 Test Mode System Window

Pressing the System Key while in Test Mode evokes a System Window. This allows the user to perform PAUSE, FEED, and CANCEL operations while in Test Mode.

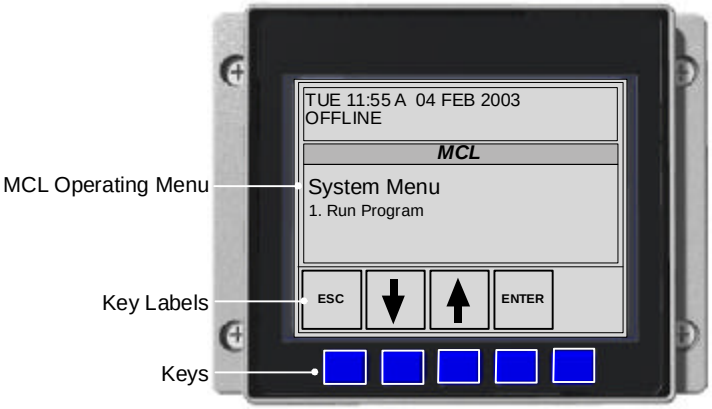


Key Label	Key and Function
ESC	The ESCAPE Key closes the System Window and returns to Test Mode.
PAUSE	The PAUSE Key temporarily suspends printing, as noted by the Current State Indicators. Pressing the key again will return the printer to normal operation.
FEED	The FEED Key advances one label, and clears any corrected faults. Also, pressing and holding this key causes the printer to perform a Quick Media Calibration; see Section 5.1.1.
CANCEL	The CANCEL Key 'pauses' the printer and then prompts you for confirmation. If yes, the current job is cancelled. The printer remains paused. Also, pressing and holding this key four seconds will reset the printer and clear temporary host settings; see Section 6.4.1.

4.1.4 MCL Mode

Enabling MCL Mode in the Menu system executes the MCL application; allowing the printer to accept input data from peripheral devices such as barcode scanners, weigh scales, and keyboards without the need of a host computer. This printer-resident application can also request and send data to locally resident lookup files or remote databases.

> ☑ ***Note:*** *The MCL program is a custom application that has been developed by your MCL Certified provider. Consult your provider for details regarding operation and support.*



Key Label	Key and Function
ESC	The ESCAPE Key has program dependent operation, and typically returns to the previous menu level.
↓	The DOWN ARROW Key has program dependent operation, and typically selects the next menu item.
↑	The UP ARROW Key has program dependent operation, and typically selects the previous menu item.
ENTER	The ENTER Key has program dependent operation, and typically selects the current menu item or function.

4.2 The Menu System

Printer operation can be controlled through the user interface from the following six menu system branches:

- Media Settings
- Print Control
- Printer Options
- System Settings
- Communications
- Diagnostics

While in the menu system, the current selection will be indicated with an asterisk (*) next to the displayed item on the display. Selections designated with a section symbol (§) will require a printer reset before becoming effective. A reset will be automatically invoked when exiting the menu system and answering 'Yes' to the 'Save Changes' prompt. Changes made will be saved. When power is removed, the new settings will be restored upon power-up.

The same functional commands from your host computer may, in some cases, override the printer's menu settings. In addition, as a security feature for the prevention of accidental or unauthorized changes, the menu system has a password protection feature; see Section 4.2.5: System Settings / Security.

☑ ***Note:*** *In the following subsections, the factory default settings are denoted with the '✧' symbol. Selections denoted with a diamond (♦) can only be changed through the menu system – all other selections can be overridden by host software commands. Consult the Class Series Programmer's Manual for specific information.*

4.2.1 Entrance and Exit Prompts

To change the printer's setup parameters via the User Interface, enter Menu Mode by pressing the MENU Key.

Depending upon enabled security settings or changes to the setup, the following Entrance and Exit Prompts may be displayed when accessing or leaving Menu Mode:

☑ ***Note:*** *While in Menu Mode, the printer will stop processing new data.*

Displayed Menu Item	Explanation
MENU MODE	Accesses the printer's Menu System.
ENTER PASSWORD 0 0 0 0	You are attempting to enter Menu Mode. Security has been enabled and now the correct user-definable password is required before access can be gained to the Menu. Using the ↑ and ↓ Keys, enter the correct numeric password. (The ENTER Key sets the (flashing) number then advances the cursor one space to the right.) After the correct number has been input, press the ESC Key to enter Menu Mode.
KEEP HOST CHANGES?	You are now entering Menu Mode. Existing Host commands have affected the configuration of the printer. Pressing the YES Key will save these changes; otherwise, pressing the NO Key will cause the printer to revert to previously saved settings.
SAVE CHANGES?	You are now exiting Menu Mode, but have made changes to the printer's settings. Pressing YES will reconfigure your printer according to these changes; otherwise, pressing NO will cause the printer to revert to previously saved settings. ☑ ***Note:*** *If changes have been made that require a reset, the printer will automatically invoke that reset.*

4.2.2 Media Settings

Displayed Menu Item	Explanation
MEDIA TYPE	Selects the printing method.
DIRECT THERMAL	For use with heat sensitive media.
✧THERMAL TRANSFER	For use with media requiring a ribbon to create an image.
SENSOR TYPE	Selects the top-of-form (TOF) sensing method for the media.
✧GAP	The printer recognizes the TOF by sensing gaps in the media.
CONTINUOUS	No TOF sensing is used with this setting. The LABEL LENGTH setting determines the Top of Form. (See Label Length.)
REFLECTIVE	The printer recognizes the TOF by sensing reflective (black) marks on the media.
LABEL LENGTH ✧04.00in (0-99.99)	When the Sensor Type is set to Continuous, this value is used to determine the length of the label.
MAXIMUM LABEL LENGTH ✧16.00in (0-99.99)	Sets the maximum length between TOF marks (gap or reflective). If this limit is exceeded, a top of form fault is declared.
PAPER OUT DISTANCE ✧00.25in (0-99.99)	Sets the length of travel before an out of stock condition is declared.
LABEL WIDTH	Sets the maximum limit for the printable width. Objects extending beyond this limit will NOT print; see Appendix C for the default values.
RIBBON LOW DIAMETER ♦ ✧1.40 in (1.00-2.00)	Sets the threshold for a low ribbon indication.

Displayed Menu Item	Explanation
SENSOR CALIBRATION ♦	Adjusts the printer to sense your media.
PERFORM CALIBRATION	The user follows steps to allow the printer to calculate the empty, gap (or mark), and paper values to set the media sensor.
ADVANCED ENTRY	The user directly inputs the best values to adjust the media sensor.
SENSOR LEVELS	Sets threshold values for the media sensor parameters. Manual entry for paper, gap (or mark), and empty thresholds.
SENSOR GAIN	Observe A/D reading and set SENSOR GAIN. Adjusts the sensitivity of the sensor for custom label stock.
PRINTHEAD CLEANING	Controls the printhead cleaning routine.
CLEAN HEAD SCHEDULE ✧000 in. (* 1000)	Specifies the inch (or centimeter) count to reach before prompting a printhead cleaning. If the number specified is exceeded three times, the printer will fault until cleaning is initiated. ☑ ***Note:*** *The number specified is multiplied by one thousand. The default value (zero) disables this function.*
CLEAN HEAD COUNTER 0 in.	Indicates the number of inches (or centimeters) since printhead cleaning was last initiated.
RESET COUNTER	Resets the Clean Head Counter to zero.
CLEAN HEAD NOW	Initiates printhead cleaning and resets the Clean Head Counter. ☑ ***Notes:*** *Check the following:* *Remove ribbon, if installed.* *Ensure that full width media is installed.* *See Section 5.4.1 for detailed instructions.*

4.2.3 Print Control

Refer to Section 2.2 for print quality information.

Displayed Menu Item	Explanation
HEAT ✧10 (0-30)	Controls the 'burn-time' of the printhead. This is the equivalent of Heat Setting on most label software programs.
PRINT SPEED	Controls the rate of label movement during the printing process; see Appendix C for range.
FEED SPEED	Controls the rate of label when the FEED Key is pressed; see Appendix C for range.
REVERSE SPEED	Controls the rate of label movement during backup positioning for start of print, cutting or present distance; see Appendix C for range.
SLEW SPEED	Controls the rate of label movement between printing areas; see Appendix C for range.
ROW OFFSET ✧00.00in (0-99.99)	Shifts the vertical start of print position. This is the user setting for row adjustment.
COLUMN OFFSET ✧00.00in (0-99.99)	Shifts the horizontal, left-justified start of print position to the right without shifting the Label Width termination point to the right. This is the user setting for Column Adjust.
PRESENT DISTANCE ✧0.00in (0-4.00)	Sets the label stop position past the start of print. When the next label format is received, the printer will automatically backfeed to the start position. If the present distance is set to zero, the printer will operate without reversing.

Displayed Menu Item	Explanation
CUSTOM ADJUSTMENTS ♦	These factory adjustments independently change the listed parameters to finely tune the printer and compensate for slight mechanical differences sometimes evident if multiple printers share label formats.
DARKNESS ✧32 (1-64)	Controls the printhead strobe timing to fine-tune the HEAT setting.
CONTRAST ✧32 (1-64)	It allows relative print edge (gray) adjustment for the print quality, which allows fine-tuning for specific media/ribbon mix.
ROW ADJUST ✧000 DOTS	Shifts the vertical start of print position in dots upward or downward to fine-tune the ROW OFFSET setting; see Appendix C.
COLUMN ADJUST ✧000 DOTS (0-128)	Shifts both the horizontal start of print position and the LABEL WIDTH termination point to the right in dots to fine-tune the COLUMN OFFSET setting; see Appendix C.
PRESENT ADJUST ✧064 DOTS (0-128)	Adjusts the label stopping position in dots to fine-tune the PRESENT DISTANCE setting; see Appendix C.

4.2.4 Printer Options

Displayed Menu Item	Explanation
MODULES	Memory available for user storage of graphics, fonts and label formats. (The physical presence of the respective memory module must be detected to show the function selections in the menu system. See Appendix C for a listing of all possible modules.)
PRINT DIRECTORY	Prints a label directory of selected, or of all available modules, the available space on these modules, the files present, and the type of module and files.
PRINT FILE	The user may select from a list of available files for sample printing.
FORMAT MODULE	The user may select from a list of available modules for formatting – all data will be erased.
DELETE FILE	The user may select from a list of available files for deleting (protected modules will not appear). Bytes will not be retrieved until the module that contained the deleted file is packed.
PACK MODULE	Packing the module removes files marked as deleted and defragments existing file structures to recover space.

Displayed Menu Item	Explanation
CUTTER	Used to cut media into separate labels.
AUTO	Automatically senses the presence of the cutter. If present, the cutter is enabled. If not detected, the cutter is ignored.
ENABLED	Enables the cutter. The presence of the cutter must be detected or read errors are generated.
✧DISABLED	Disables the cutter.
RIBBON SAVER	Used to conserve ribbon when the label contains no-printing areas.
AUTO	Automatically senses the presence of the ribbon saver option. If present, the option is enabled. If not detected, the option is ignored.
ENABLED	The presence of the ribbon saver option must be detected or read errors are generated.
✧DISABLED	Disables ribbon saving.
SCANNER	Used to check linear bar codes in the picket-fence orientation (bar codes perpendicular to the label's leading edge).
MODE	Enables bar codes to be read by the Scanner.
✧AUTO	Automatically senses the presence of the scanner. If present, the scanner is enabled to read bar codes. If not detected, the scanner is ignored.
ENABLED	The presence of the scanner must be detected or read errors are generated.
DISABLED	Disables the scanner.

Displayed Menu Item	Explanation
BARCODES	Enables the scanner to read the respective bar code. Also see Appendix B. ☑ ***Note:*** *To speed throughput and decoding integrity only enable the symbologies that you will be reading.*
✧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	
BARCODE COUNT ✧00 (0-99)	Used to set the specific number of bar codes to be read on the label. 00 selects AUTO Mode, allowing a variable number of bar codes to be read per label format. ☑ ***Note:*** *AUTO Mode should not be used with imaged (bitmapped) bar codes or with certain bar code addendums; see Appendix B for a listing.*

Displayed Menu Item		Explanation
MIN READABLE HEIGHT		Used to ensure bar code integrity by selecting the vertical distance of the bar code that must have identical reads. The printer will calculate the scan rate and the number of required consecutive reads based on the selected height and print speed. ☑ ***Note:*** *The selected distance should not exceed 50% of the measured bar code height.*
1/16 in	(1.5 mm)	Ensures that 1/16 inch of the bar code is 100% readable.
2/16 in	(3.0 mm)	Ensures that 1/8 inch of the bar code is 100% readable.
3/16 in	(4.5 mm)	Ensures that 3/16 inch of the bar code is 100% readable.
1/4 in	(6 mm)	Ensures that 1/4 inch of the bar code is 100% readable.
1/2 in	(12.5 mm)	Ensures that 1/2 inch of the bar code is 100% readable.
✧DISABLED		When 'Disabled' is selected, the printer defaults to REDUNDANCY LEVEL.

Displayed Menu Item	Explanation
REDUNDANCY LEVEL	Used to ensure the data integrity of the bar code. The selected level determines the number of consecutive, identical decodes that are required to pass the bar code (i.e., if set to three times, the bar code will not pass until it has been decoded with the same value three successive times.) ☑ ***Note:*** *Depending upon the print speed, higher verification levels may cause erroneous failures when scanning multiple bar codes or bar codes that are small in height. Refer to the documentation supplied with the Scanner for the exact number of scans at a given print speed.*
READ BARCODE (1X)	One decode is required per bar code.
✧READ BARCODE (2X)	Two consecutive, identical decodes are required per bar code.
READ BARCODE (3X)	Three consecutive, identical decodes are required per bar code.
READ BARCODE (4X)	Four consecutive, identical decodes are required per bar code.
READ BARCODE (5X)	Five consecutive, identical decodes are required per bar code.
READ BARCODE (6X)	Six consecutive, identical decodes are required per bar code.
SET DEFAULTS	Resets the current settings of the Scanner to the default settings.

Printer Options (continued)

Displayed Menu Item	Explanation
GPIO PORT ♦	Used to interface the printer to external controlling devices (see Appendix D).
GPIO DEVICE	Sets the GPIO Port to work with a specific type of device.
APPLICATOR	Enables the GPIO for a label applicator.
BARCODE VERIFIER	Enables the GPIO for a bar code verifier.
✧DISABLED	Disables the GPIO Port.
START OF PRINT	Programmable signal input that controls the Start of Print (SOP) process.
✧ACTIVE LOW	SOP signal must go 'low' for at least 50 milliseconds to initiate printing.
ACTIVE HIGH	SOP signal must go 'high' for at least 50 milliseconds to initiate printing.
END OF PRINT	Programmable signal output that signifies the End of Print (EOP) process.
✧ACTIVE LOW	Outputs a logic 'low' following printing.
ACTIVE HIGH	Outputs a logic 'high' following printing.
LOW PULSE	Outputs a low pulse (approximately 30 milliseconds long) following printing.
HIGH PULSE	Outputs a high pulse (approximately 30 milliseconds long) following printing.
RIBBON LOW	Programmable signal output that signifies the Ribbon Low Diameter condition; see Section 4.2.2.
✧ACTIVE HIGH	Outputs a logic 'high' when the ribbon reaches the Ribbon Low Diameter setting.
ACTIVE LOW	Outputs a logic 'low' when the ribbon reaches the Ribbon Low Diameter setting.

4.2.5 System Settings

Displayed Menu Item	Explanation
CONFIGURATION FILE ♦	Options for storage and recall of printer configuration files. See Appendix F for details.
RESTORE AS CURRENT	Provides a list of available configuration files. Selecting a file from the list causes a printer reset; afterward, the printer is configured according to the activated file.
SAVE SETTING AS	Saves the entire effective configuration of the printer to a file. Unique names with up to nineteen characters are possible.
DELETE FILE	Provides a list of available configuration files. Files selected are immediately removed, freeing the module. ☑ ***Note**: A currently activated file cannot be deleted.*
FACTORY SETTING FILE	Provides a list of available configuration files. The selected file will be restored whenever a Level 1 reset is performed; see Section 6.4.1.
INTERNAL MODULE ✧1024 KB (100-5120)	Sets the number of 1K blocks allocated for the internal RAM 'D' module.
DEFAULT MODULE ✧D	Sets the default module used to store files when no other module is specified; see Appendix C.
SCALEABLE FONT CACHE ✧0312 KB (100-5120)	Sets the number of 1K blocks allocated for the scaleable font engine. Available memory dependent upon model; see Appendix C.
SINGLE BYTE SYMBOLS	Selects the code page used to print single byte fonts unless otherwise specified in DPL.
✧PC_850 MULTILINGUAL	One of 66 selectable standard sets; see the *Class Series Programmer's Manual* for details.

Displayed Menu Item	Explanation
DOUBLE BYTE SYMBOLS	When equipped with the ILPC option, this selects the code page used to print double byte fonts unless otherwise specified in DPL; see the *Class Series Programmer's Manual* for details.
✧UNICODE	Unicode (including Korean)
GB	Government Bureau Industry Standard; Chinese (PRC)
BIG 5	Taiwan encoded
JIS	Japanese Industry Standard
SHIFT JIS	Shift Japanese Industry Standard
EUC	Extended UNIX Code
TIME AND DATE	Allows the user to set the printer's time and date.
MEDIA COUNTERS ♦	Internal record of inches printed and time of use.
ABSOLUTE COUNTER	Shows the number of inches printed since being set at the factory. Not resettable.
RESETTABLE COUNTER	The number of inches printed since the last reset. User may reset.
RESET COUNTER	Resets the Resettable Counter to zero.
PRINT CONFIGURATION	Prints the effective configuration of the system. In addition, if settings were changed that require a reset to become effective, this will be indicated with the '§' symbol. A bulleted item (•) indicates that it was changed via the host, but not yet saved in Flash memory.

Displayed Menu Item	Explanation
CONFIGURATION LEVEL ♦	To upgrade the application program (resident software) version of the printer, the hardware and software compatibility levels must match for the update to be accepted. This information is displayed here and on the configuration label.
PRINTER KEY	Each printer has a unique Key number in the following form: vvvv-cwxx-yyyyyy-zzz Where: vvvv Represents the model number of the application loaded cwxx Represents the hardware/software feature level, where: c – represents the printer class. w – represents hardware feature level of the main board. xx – represents the software feature level: 10 = Standard DPL 20 = Internal CG Times Font (Software features are accepted up to the 'xx' value - increases beyond that require an authorization code). yyyyyy Is a manufacturing date code zzz Is a unique time stamp
APPLICATION VERSION	Displays the Application version of the printer's firmware.
BOOT LOADER	Displays the Boot Loader version of the printer's firmware.
UPGRADE PRINTER CODE	This function is used to upgrade the software feature level of the printer. Datamax authorization is required.
UNLOCK FEATURE	This function is used to unlock the additional optional features within the printer. Datamax authorization is required.

Displayed Menu Item	Explanation
SET FACTORY DEFAULTS	Parameters in this menu listing with the '✧' symbol are the designated defaults.
SET FACTORY DEFAULTS	Restore the current settings to the factory defaults or, if selected the Factory Setting File. ☑ ***Note:*** *The reset will be automatic. If no Factory Setting File is used, all menu settings (except* `HEAD BIAS, CUSTOM ADJUSTMENTS` *and calibrations) will be restored.*
FORMAT ATTRIBUTES	Affects the manner in which overlapping text and graphics are treated. Consult the *Class Series Programmer's Manual* for details.
✧XOR	Intersecting text, images, and bar codes print on top of one another.
OPAQUE	Intersecting text, images, and bar codes are obliterated by those formatted last (each character is treated as opaque).
TRANSPARENT	Intersecting text, images, and bar codes will not be printed (but an odd number of overlapping objects will print.)
BUZZER ♦	Audible signaling device that sounds to acknowledge User Interface entries and, if enabled, during printer warning and fault conditions.
✧ENABLED	Turns 'On' the buzzer for printer warning and fault conditions.
DISABLED	Turns 'Off' the buzzer for printer warning and fault conditions.
HEAD BIAS ♦	Instructs the printer to switch the dot zero orientation. (The dot zero left / right reference point is given relative to the label output side of the printer). ⚠ ***WARNING:*** *Switching this setting will cause the printer to reverse all of the media movement directions.*
✧STANDARD	Dot zero occupies the left-most location on the printhead; printing is left justified.
RIGHT HAND	Dot zero occupies the right-most location on the printhead; printing is right justified.

Displayed Menu Item	Explanation
LABEL ROTATION ♦	Instructs the printer to rotate the label format 180 degrees before printing.
ENABLED	Label formats are flipped top to bottom.
✧DISABLED	Label formats are printed normally.
IMAGING MODE ♦	Instructs the printer whether to pre-image the label format. ☑ ***Note:*** *This selection can affect the accuracy of time-stamped labels and label throughput.*
✧MULTIPLE LABEL	The printer images multiple labels as memory permits, achieving the fastest throughput; however, if time-stamping, the time will reflect the moment the label is imaged rather than when actually printed.
SINGLE LABEL	The printer images the next label only after the previous label has been successfully printed. Single processing provides time-stamps that are more accurate, but it slows label throughput time.
PAUSE MODE	When enabled, suspends printing between each label until the PAUSE Key is pressed.
ENABLED	Requires an operator press the PAUSE Key after each label.
✧DISABLED	The printer completes label batch without pausing between labels.
PEEL MODE	Specifies that the printer is to wait for the GPIO start of print signal.
ENABLED	Feed is inhibited according to the above criteria.
✧DISABLED	Feed is always enabled.

Displayed Menu Item	Explanation
SECURITY ♦	Provides the user with the ability to password-protect all settings available through the User Interface.
SELECT SECURITY	Enable or disable the security feature of the User Interface.
MENU AND TEST	The Menu and Test areas will require a password before access is granted (these buttons will be shaded, indicating that security is enabled).
SECURE MENU	The Menu area will require a password before access is granted (the button will be shaded, indicating that security is enabled).
✧DISABLED	All menu items are accessible without protection.
MODIFY PASSWORD	Modify the numeric password required to access the menu system when security is enabled. You will be prompted to enter a new password. Enter a password using the ↑ and ↓ Keys. (The ENTER Key sets the current [flashing] number then shifts the cursor to the right.) After the password has been input, press the ESC Key. You will be prompted to '`CONFIRM NEW PASSWORD`.' Re-enter the same numeric password.

Displayed Menu Item	Explanation
UNITS OF MEASURE	Selects the measurement system in which the system's settings are represented in the menu system and on configuration labels.
✧IMPERIAL	Inch standard: lengths and counters given in inches.
METRIC	Metric standard: lengths given in millimeters and counters in centimeters.
INPUT MODE ♦	Defines the type of printer language.
✧DPL	Standard DPL processing.
LINE	Standard DPL processing with addition Line mode Template processing enabled. Line Mode exacts data terminated by a carriage return to be inserted in a DPL template and printed.
SOP EMULATION ♦	Enables the <STX>O and <STX>f print positioning commands to allow backward compatibility with label formats designed for other printers. (When changing these values, the printer will automatically feed two labels to setup the new print position.)
✧DISABLED	No emulation: natural start of print position. (System Commands <STX>O and <STX>f are ignored).
110 (PRODPLUS)	Emulates the Prodigy Plus® printer.
220 (ALLEGRO)	Emulates the Allegro® printer.
250 (PRODIGY)	Emulates the Prodigy™ printer.

Displayed Menu Item	Explanation
BACK AFTER PRINT	When a Present Distance is set with the GPIO enabled, this determines the timing of the label back up.
ENABLED	Commands the printer to immediately back up the label after the applicator issued start of print signal is received for faster throughput.
✧DISABLED	The printer will not initiate repositioning until the next label is ready to print. May help prevent the curling of the label edge.
FONT EMULATION ♦	This command allows font substitution for all Datamax internal fonts. See Appendix B for examples.
✧STANDARD FONTS	Prints using standard available fonts. See Appendix B for examples.
CG TIMES	Prints using CG Times fonts only.
USER ID S50	Prints using a downloaded font only.
MENU LANGUAGE ♦	Selects the language in which the menu system messages and configuration label are shown. Only languages that are resident will be shown. See Appendix E for downloading information.
✧ENGLISH	English
FAULT HANDLING♦	When a fault condition (ribbon out, media out, etc.) is detected, this setting determines the level of intervention and the disposition of the label being printed at the time the fault occurred.
LEVEL	Selects the printer's action, the action required by the operator, and the label's reprint status.
✧STANDARD	Printing stops and a fault message is displayed. After the problem is corrected, the FEED Key must be pressed to clear the fault. The label in process is reprinted.

Displayed Menu Item	Explanation
VOID AND RETRY	Depending upon the RETRY COUNT, one of the following actions when faulted: • If the Retry Count setting has not been exceeded, 'VOID' is printed on the label in process and reprinting occurs automatically; or, • If the Retry Count has been exceeded, printing stops and a fault message is displayed. After the problem is corrected, the FEED Key must be pressed to clear the fault. The label in process is reprinted; or, • If the CANCEL Key is pressed the operator now has the option of canceling the reprint: To allow the reprint, press the ESCAPE Key or to cancel the reprint, press the ENTER Key (the operator now has the option of canceling the entire label batch by pressing the ENTER Key again.) ☑ ***Notes:*** *1) If a Linear Scanner is not attached, this menu item will cause the printer to perform as it does in the Standard fault handling setting (see above), except that VOID will be printed on the faulted label.* *2) VOID will not be printed when insufficient space exists for the height of the text (see VOID DISTANCE, below) or if the fault occurred after the entire label was completed (i.e., when the label reaches its Present Distance at or above the TOF).* *3) The Void Message can be customized, see the Class Series Programmer's Manual for downloading details.*
NO REPRINT	Printing stops and a fault message is displayed. After the problem is corrected, the FEED Key must be pressed to clear the fault. The label in process is *not* reprinted.

Displayed Menu Item	Explanation
VOID DISTANCE ✧0.50 in (.10-2.00)	Sets the distance to backup the faulted label to print 'VOID' on its trailing edge, which also indirectly establishes the font size of the void message.
RETRY COUNT ✧1 (0-3)	Establishes the number of times the printer will attempt to reprint a label. If the last label printed in this count has been voided, the printer will stop and display a fault message. ☑ ***Note:*** *Retry counts above 1 are only valid for printers equipped with the Linear Scanner option.*

4.2.6 Communications

Displayed Menu Item	Explanation
SERIAL PORT A ♦	Controls the communications settings for Serial Port A.
BAUD RATE	Determines the serial communication rate.
38400	38400 bits per second
28800	28800 bits per second
19200	19200 bits per second
✧9600	9600 bits per second
4800	4800 bits per second
2400	2400 bits per second
1200	1200 bits per second
PROTOCOL	Sets the data flow control (handshaking) method.
✧BOTH	Uses both handshaking methods.
SOFTWARE	XON/XOFF
HARDWARE	CTS/DTR
NONE	No flow control is used.
PARITY	Sets Word parity
✧NONE	No parity
ODD	Odd parity
EVEN	Even parity
DATA BITS	Sets Word length
7	Seven bit Word length
✧8	Eight bit Word length
STOP BITS	Sets the number of stop bits
✧1	One stop bit
2	Two stop bits
SERIAL PORT B♦	This port controls the communications settings for the Aux Serial Port on the Applicator Interface Card. The available settings are the same as those for the Serial Port A, above.

Communications (continued)

Displayed Menu Item	Explanation
PARALLEL PORT A♦	Controls the communications settings for Parallel Port A.
PORT DIRECTION	Determines if data is sent from the printer to the host via the parallel port.
✧UNI-DIRECTIONAL	One-way printer communication.
BI-DIRECTIONAL	Enables IEEE 1284 back-channel operation.
PARALLEL PORT B♦	Same as Parallel Port A, for an optional Ethernet connection. If not present, this displays 'NOT INSTALLED' when accessed.

☑ ***Note:*** *If 'LOCKED' appears when attempting to access the NIC ADAPTER submenu, the printer may have active print requests or multiple users may be trying to access these parameters (for example, during simultaneous telenet sessions).*

Displayed Menu Item	Explanation
NIC ADAPTER♦	DMXNet and DMXrfNet are the optional Network Interface Card (NIC) Adapters. If not present, this displays 'NOT INSTALLED' when accessed. After making changes to these parameters, save the changes, exit the menu system, and cycle the printer's power 'Off' and 'On' for the changes to take effect. ☑ ***Note:*** *The boot process (taking up to two minutes) must be completed at power-up. During this time, the NIC Adapter will not be accessible or configurable; "DMXNET INACTIVE" will be indicated when in the menu system or on a Configuration Label. After this process, you will be able to configure the options provided using the menu system.*
IP ADDRESS	The static IP address of the NIC Adapter in standard dotted-decimal format.
SUBNET MASK	The static subnet assigned to the NIC Adapter.
GATEWAY	Specifies the network gateway address the NIC Adapter should use.
SNMPTRAP DESTINATION	Selects the Network IP address where all SNMP Traps will be sent. If zeroed, no traps are sent.
PROTOCOL	Sets the network protocol to be recognized by the NIC Adapter.
NETWARE	Allows the printer to be driven from an NDS Novell Print Queue.
✧ENABLED	NetWare is enabled by default.
DISABLED	Ignores the NetWare protocol. Select this option if NetWare is not needed.

Displayed Menu Item	Explanation
DISCOVERY	This is the address discovery method used by the card if a static address is not utilized. If no server for any of the discovery methods is found, the static value specified above is used. ☑ ***Note:*** *For faster NIC Adapter boot times, disable any discovery methods not used.*
DHCP	Dynamic Host Control Protocol. Automatically assigns an IP address from a DHCP Server.
✧ENABLED	DHCP is enabled by default. This means that the card will send a broadcast into the network on start-up in order to receive an IP Address from the responsible server. ⚠ ***WARNING:*** *An IP Address assigned by DHCP has precedence over any stored static IP Address.*
DISABLED	Disables DHCP. ☑ ***Note:*** *Select this option to ensure that any stored static IP is used by the NIC Adapter.*
SET FACTORY DEFAULTS	Restore the current NIC Adapter settings to the factory defaults.
HOST SETTINGS ♦	Settings that affect all communications with a host.
HOST TIMEOUT ✧10 SEC (1-60)	The number of seconds a communications port must be idle before the printer may process data from a different port. This value is also used to "timeout" an image / label format download (i.e., if, at any time, data flow stops before a complete label format is received, the data will be ignored).

Displayed Menu Item	Explanation
CONTROL CODES	Allows the operator to change the prefix of the software commands interpreted by the printer.
✧STANDARD CODES	Hex 01 = SOH command; Hex 02 = STX command; count-by = ^; Hex 1B = ESC; Hex 0x0D = Carriage Return
ALTERNATE CODES	Hex 5E = SOH command; Hex 7E = STX command; count-by = @; Hex 1B = ESC; Hex 0x0D = Carriage Return
ALTERNATE CODES 2	Hex 5E = SOH command; Hex 7E = STX command; count-by = @; Hex 1B = ESC; Hex 0x7C = Carriage Return
CUSTOM CODES	Each DPL command (SOH, STX, CR, and count-by) may be selected by entering the desired Hex code. (The ↑ and ↓ Keys will scroll the characters, while the ENTER Key selects character and then advances the cursor.)
FEEDBACK CHARACTERS	Returns a Hex 1E, [RS], after each label successfully prints, and a Hex 1F, [US], after each batch of labels is printed.
ENABLED	Feedback characters are sent to the host.
✧DISABLED	No feedback characters are sent.
ESC SEQUENCES	Allows data containing invalid ESC control code sequences to be processed, helpful because some systems send a “banner” to the printer.
✧ENABLED	Normal printer operating mode.
DISABLED	ESC sequences are ignored and the data is processed. Bitmapped font downloads are disabled in this mode.

Displayed Menu Item	Explanation
HEAT COMMAND	Allows the user to disable the DPL Heat Command, providing compatibility with other DATAMAX printers.
✧ENABLED	Normal printer operating mode.
DISABLED	DPL Heat commands are ignored. The heat value is controlled via the menu setting; see Section 4.2.3.
SPEED COMMANDS	Allows the user to disable the DPL speed commands (Print, Feed, Slew, and Reverse).
✧ENABLED	Normal printer operating mode.
DISABLED	DPL speed commands are ignored. The speeds are controlled via the menu setting; see Section 4.2.3.
TOF SENSING COMMANDS	Allows the user to disable the DPL Top of Form commands (Gap, Continuous, and Reflective).
✧ENABLED	Normal printer operating mode.
DISABLED	DPL TOF commands are ignored. The TOF is controlled via the menu setting; see Section 4.2.2.
SYMBOL SET COMMAND	Allows the user to disable the DPL Single and Double Symbol Set selection commands.
✧ENABLED	Normal printer operating mode.
DISABLED	DPL Symbol Set commands are ignored. The Symbol Set selection is controlled via the menu setting; see Section 4.2.5.
CNTRL-CODES (DATA)	Allows the user to remove control codes (data < 20 Hex) from the data fields. The selected line terminator is processed.
✧ENABLED	Normal printer operating mode.
DISABLED	DPL Control Code (SOH, STX, CR, ESC, and ^) functions are ignored.

Displayed Menu Item	Explanation
STX-V SW SETTINGS	Allows the user to disable DPL software switch settings commands.
✧ENABLED	Normal printer operating mode.
DISABLED	DPL option-enable command (<STX>V) is ignored.

4.2.7 Diagnostics

Displayed Menu Item	Explanation
HEX DUMP MODE ♦	Most commonly used for troubleshooting. Prints data and instructions received from the host rather than interpreting them as label formats; see Section 6.3.
ENABLE	Prints raw ASCII data received from the host rather than executing the commands.
✧DISABLE	Executes and prints label formats (normal operating mode).
OPTIONS TESTING ♦	Allows or performs diagnostics of specific options within the printer.
TEST CUTTER	Performs a functional test of the cutter.
PERFORM TEST 1 TIME	The test will cycle the selected number of times (1, 10, or 100; use the ↑ and ↓ Keys) with the results displayed following each attempt.
TEST RIBBON SAVER	Performs a functional test of the ribbon saver circuits and mechanisms.
PERFORM TEST 1 TIME	The test will cycle the selected number of times (1, 10, or 100; use the ↑ and ↓ Keys) with the results displayed following each attempt.
TEST GPIO	Performs a functional test of the General Purpose Input Output interface. See Appendix D.
MONITOR GPIO INPUT SOP FEED PAUSE REPRT 1 1 1 1	Input values are displayed for the SOP (Start of Print), Feed, Pause, and Reprint lines. ☑ ***Note:*** *Unconnected lines may display a zero or one value.*
TEST GPIO OUTPUT EOP RL SR MO RO DRDY 0 0 1 1 1 1	Output logic values are reported, where: EOP = End of Print; RL = Ribbon Low; SR = Service Required; MO = Media Out; RO = Ribbon Out; and, DRDY = Data Ready. (The ↑ and ↓ Keys toggle the output state, while the → Key advances the cursor.) See Appendix D for the GPIO Port pin-outs.

Displayed Menu Item	Explanation
LOOPBACK	Performs an internal test of the GPIO Port circuitry. ☑ ***Note:*** *Before executing this test, remove the connection to the GPIO Port.*
PRINT SIGNAL INFO	Prints a label containing GPIO Port signal names, programmed settings, and current states. See Appendix D for a sample of the label.
TEST SCANNER	Performs a functional test of the optional linear scanner.
SCAN TEST	Enters a "read once mode." A bar code is read and the decoded results are displayed.
ALIGNMENT TEST	Enters a "constant read mode." Bar codes are read; decoded results are displayed; and, the read-count is incremented.
PRINT TEST RATE (min) ♦ ✧000 (0-120)	The number of minutes to delay between the printing of batches of Test Labels.
SENSOR READINGS ♦	Analog Sensor readings are displayed.
THR TRAN RIB M 24V HD RANK 255 255 255 255 255 255	Live sensor values are displayed. Maximum values are shown in this example, where: THR = thermistor sensor; TRAN = transmissive (gap) media sensor (REFL is shown when SENSOR TYPE is set to 'reflective'); RIB M = ribbon motion sensor; 24V = 24 volt DC power supply sensor; HD = head-down sensor; and, RANK = the value of the printhead ranking resistor.
RIBBON SENSOR LIMITS ♦	Displays ribbon sensor ADC low and high values used for motion detection.
RIBBON ADC LOW HIGH 070 164	Approximate default values are shown here (actual values will vary).

4.2.8 MCL Options

Displayed Menu Item		Explanation
MCL AT POWER-UP ♦		MCL (Macro Command Language) is tool suite designed for data collection applications. The printer will accept input data from peripheral devices and the application can request and send data to locally resident lookup files or remote databases.
	ENABLED	After power to the printer is turned 'Off' and 'On,' MCL will be started. The printer is now ready to accept input data from peripheral devices such as barcode scanners, weigh scales, and keyboards without the need of a host computer.
	✧DISABLED	Normal printer functions.
START MCL ♦		MCL with be started after exiting from the menu.

4.3 Printer Messages

The printer displays several different types of information (if not in Menu or Test Mode):

- Enter and Exit Prompts; see Section 4.2.1
- Alert Prompts and Condition Messages; see Section 4.3.1.
- Application and Boot Loader Updating Messages; see Sections 5.5 and 5.6.
- Fault and Warning Messages; see Section 6.2.

4.3.1 Alert Prompts and Condition Messages

Alert Prompts appear when an action is required of the operator, while Condition Messages are used to indicate an operational state of the printer.

Prompts and Condition Messages		
Displayed Message	**Description**	**Cause(s)**
CLEARING FAULTS	The printer is trying to clear a fault condition.	The FEED Key was pressed after a fault.
CALIBRATING	Media calibration is being performed.	The FEED Key was pressed and held.
CANCEL REPRINT ENTER KEY = YES	The current label will not be reprinted if the ENTER Key is pressed. (Any labels remaining in the batch will be printed.)	The CANCEL or TEST Key was pressed during the fault handling process.
CANCEL BATCH ENTER KEY = YES	The remaining labels in the current batch will not be printed if the ENTER Key is pressed.	The CANCEL or TEST Key was pressed during a batch job.
DMXNET INITIALIZING	Normal power-up and soft reset condition when equipped with the DMXNet option.	The network card is initializing. Depending upon the programmed settings, this process can take up to two minutes.

User Prompts and Condition Messages *(continued)*		
Displayed Message	**Description**	**Cause(s)**
OFFLINE	The printer is in Menu or Test Mode.	The Menu or Test Key has been pressed.
PAUSED	The printer is paused.	The PAUSE Key has been pressed or Paused Mode has been selected.
NOT INSTALLED	Indicates the menu item cannot be enabled.	The option is not installed or cannot be detected by the printer.
PRINTHEAD CLEANING	Indicates that printhead cleaning is in progress.	The TEST Key was pressed and held, or 'CLEAN HEAD NOW' was selected.
READY	Normal operating mode. The printer is ready to receive label formats, downloads, etc.	The printer is in Ready Mode.
REMOVE RIBBON PRESS ANY KEY	In order to initiate printhead cleaning, ribbon must be removed.	The TEST Key was pressed and held, or 'CLEAN HEAD NOW' was selected.
SYSTEM INITIALIZING	Normal power-up and soft reset condition.	Follows the 'SYSTEM RESET IN PROGRESS' message after a reset or power-up.
SUCCESSFUL PRESS ANY KEY	Printhead cleaning was successfully completed.	The TEST Key was pressed and held, or 'CLEAN HEAD NOW' was selected.
SYSTEM RESET IN PROGRESS	Normal power-up and soft reset condition.	The user has reset the printer via the host or User Interface.

User Prompts and Condition Messages *(continued)*		
Displayed Message	**Description**	**Cause(s)**
UNCALIBRATED	The media calibration must be performed; see Section 5.1.	The printer is not calibrated.
WAITING FOR DATA	A Start of Print signal has been received.	The printer is waiting for label data to be supplied by the host.
WAITING FOR SIGNAL	A label is waiting to be printed.	The printer is waiting for the Start of Print signal to be supplied by the applicator.
XXXX OF XXXX PRINTING	The print job is being processed.	The printer is updating the batch status, showing initial and remaining label counts.

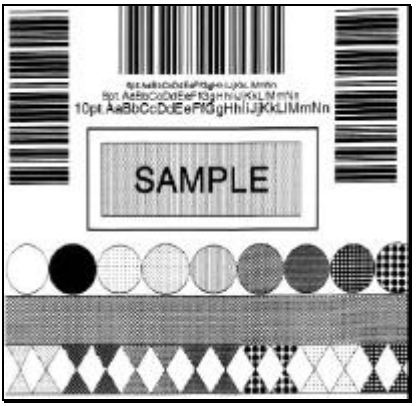
4.4 Test Mode

The internally generated Test Labels are printed at pre-selected speed and heat settings. Changes to these label settings can be made from the Menu System or via software commands.

> ☑ ***Notes:***
>
> *(1) Except as noted, use full width media to capture the entire format; otherwise, adjust the Label Width (Section 4.2.2) and Leveling Cam settings (Section 5.2.1) to the media's width.*
>
> *(2) In Test Mode, press the ESC Key or the TEST Key to stop printing.*
>
> *(3) A printing time delay can be set (see Print Test Rate, Section 4.2.7).*

4.4.1 Print Quality Label

The Print Quality Label is a general indicator of overall print quality. The format, consisting of compliant fence and ladder bar codes, assorted sizes of fonts, and graphic fill patterns, can be used to ensure conformance, as well as aesthetics. Generate a Print Quality Label as follows:



1. Press the TEST Key.
2. Press the ← Key to scroll to 'Print Quality Label.'
3. Press the COUNT Key to select a quantity; see Section 4.1.3.
4. Press the ENTER Key to begin printing.

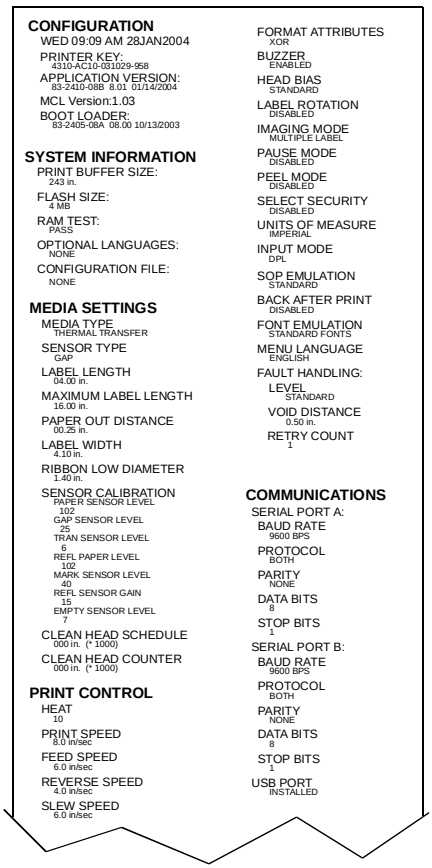
4.4.2 Configuration Label

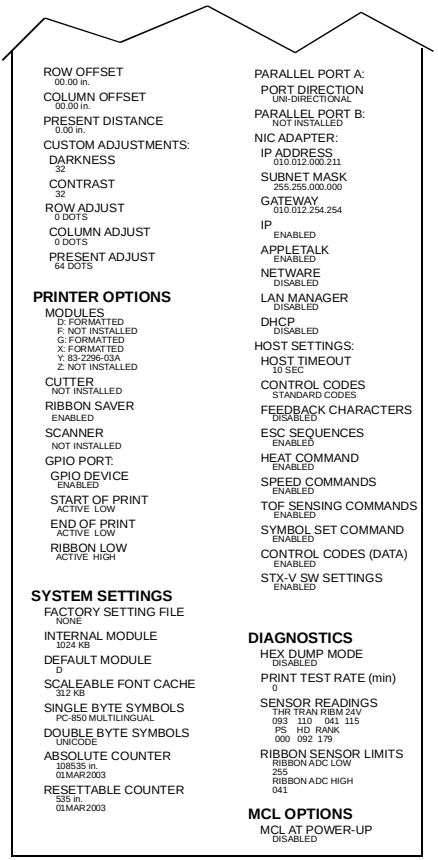
The Configuration Label provides current printer database information, as detailed in Section 4.2. Generate a Configuration Label as follows:

1. Press the TEST Key.
2. Press the ← Key to scroll to 'Print Configuration.'
3. Press the ENTER Key to begin printing.

☑ ***Notes:*** *(1) The information will vary with the printer model, firmware version and options.*

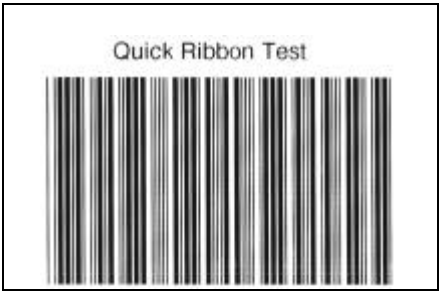
(2) To capture all data, use media that is at least 2 inches (51 mm) wide and adjust the Label Width setting accordingly (see Section 4.2.2).





4.4.3 Quick Ribbon Test Label

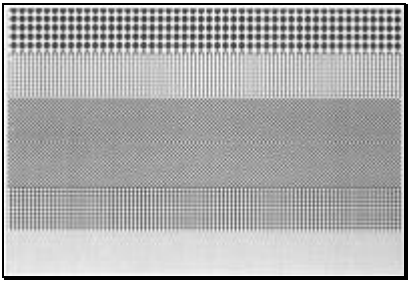
The Quick Ribbon Test Label is an indicator of thermal transfer print quality. Generate a Quick Ribbon Test Label as follows:



1. Press the TEST Key.
2. Press the ← Key to scroll to ‘Ribbon Test Label.’
3. Press the COUNT Key to select a quantity; see Section 4.1.3.
4. Press the ENTER Key to begin printing.

4.4.4 Dot Test Pattern Label

The Dot Test Pattern Label gives an indication of the printhead’s condition, featuring print patterns that exercise all the thermal elements. Generate a Dot Test Pattern Label as follows:



1. Press the TEST Key.
2. Press the ← Key to scroll to ‘Dot Test Pattern.’
3. Press the COUNT Key to select a quantity; see Section 4.1.3.
4. Press the ENTER Key to begin printing.

4.4.5 Validation Label

The Validation Label is another useful tool for establishing print quality. Generate a Validation Label as follows:

1. Press the TEST Key.
2. Press the ← Key to scroll to 'Validation Label.'
3. Press the COUNT Key to select a quantity; see Section 4.1.3.
4. Press the ENTER Key to begin printing.

4.4.6 Print Last Label

Print Last Label reprints the last label format printed. The format can be any of the Test Labels, a label from the host, or one recalled from memory.

> ☑ ***Note:*** *If a job was cancelled prior to its completion, or if power has been removed since the last print job and the request for this label, this selection will the 'VOID' message.*

4.4.7 User Defined Label

The User Defined Label reprints from a list of previously printed label formats. Use the ← Key to scroll through the listing, then use the ENTER Key to select and print the label.

☑ ***Note:***	*If a job was cancelled prior to its completion, or if power has been removed since the last print job and the request for this label, 'NO FILES AVAILABLE' will be displayed and no printing will occur.*

4.4.8 Demo

The Demo mode displays a rotating globe and sample system fonts in the graphic display center window. Use the TEST Key to return to test mode or the MENU Key to return to the system menu.

Adjusting and Maintaining the Printer

5.1 Media Sensor Calibration

In addition to the adjusting the Media Sensor and setting the 'Sensor Type,' calibration ensures correct and reliable label detection.

5.1.1 Quick Calibration

Perform the Quick Media Calibration during initial printer set-up or after changing the media to fine-tune the media sensor's gap and label values.

> ☞ *This procedure is not required for continuous media. If 'Uncalibrated' is displayed, follow the Media Sensor Calibration procedure.*

1. Ensure that media is loaded (see Section 3.4), that the Media Sensor is adjusted (see Section 3.6), and that the printer is in an idle state.
2. Press and hold the FEED Key.

   Media will begin to advance.
3. Allow at least one label gap (or mark) to pass under the sensor before releasing the FEED Key.

Upon successful completion, the 'Calibration Completed' message will flash; the printer will feed to the next label TOF and 'Ready' will be displayed. (A 'Warning Low Backing' message may appear if using notched media or media on a transparent liner; however, the calibration was successful).

> ☑ ***Note:*** *Media containing large gaps may require a change in the 'Paper Out Distance' setting before Quick Calibration; see Section 4.2.2.*

Calibration Hints: In certain cases, the printer may have trouble differentiating between the label and liner. If 'Cannot Calibrate' is displayed, try calibrating over a longer distance, as follows:

- Press and hold the FEED Key to allow two or more gaps (or marks) to pass under the sensor.

If this method also fails (that is 'Cannot Calibrate' is displayed again), perform the Standard Calibration (Section 5.1).

5.1.2 Standard Calibration

Perform the Standard Calibration when 'Cannot Calibrate' or 'Uncalibrated' is displayed. During the process, the printhead assembly can be raised for visual access. In addition, displayed sensor readings can be used to indicate the best position over the media, which is helpful when using small, position-critical TOF notches or marks. Three readings are required:

- Empty: No media in the sensor.
- TOF Mark: Only the backing, notch, or reflective mark in the sensor.
- Paper: The label (with the liner attached) in the sensor.

Perform a Standard Calibration as follows:

Step	Action	Display Message	Comment
1	(Media should be loaded and the 'Sensor Type' set.) Turn 'On' the printer.	CANNOT CALIBRATE *-or-* UNCALIBRATED	Wait until the printer initializes (about six seconds).
2	Press the MENU Key.	MEDIA SETTINGS	The Menu Window will appear.
3	Press the ENTER Key to enter the Media Settings menu.	MEDIA TYPE	See Section 4.2.2 for menu items.
4	Press the ↓ Key to scroll to 'Sensor Calibration'.	SENSOR CALIBRATION	Press the ESC Key to abort this procedure.
5	Press the ENTER Key.	PERFORM CALIBRATION	You are beginning the calibration procedure.

Standard Calibration (continued)

Step	Action	Display Message	Comment
6	Press the ENTER Key. Remove the media from the Media Sensor then press any key.	REMOVE LABEL STOCK PRESS ANY KEY <yyy>	Sets the 'empty' value - where 'yyy' is a numerical value representing the current sensor reading.
7	Proceed according to the type of media being calibrated: **Die-cut:** a) Strip a label or two from the liner material. b) Reinstall the media. c) Place only the liner under the sensor. d) Position the Sensor Eye Mark over the middle of the liner. d) Press any key. **Notched:** a) Position the Sensor Eye Mark over the center of the notch. b) Press any key. **Reflective:** a) Position the Sensor Eye Mark over the center of the black mark. (The black mark must be facedown to be sensed properly.) b) Press any key. **Continuous:** Go to Step 8.	SCAN BACKING PRESS ANY KEY <yyy> *-or, for reflective media:* SCAN MARK PRESS ANY KEY <yyy>	Sets the 'gap' (or 'mark') value - where 'yyy' is a numerical value representing the current sensor reading. ☑ ***Note:*** *Never position a perforation in the sensor when recording a sensor reading.*

☑ ***Note:*** *Do NOT move the position of the Media Sensor after it has been adjusted.*

Step	Action	Display Message	Comment
8	Position a label (and backing, if any) under the Sensor Eye Mark. Press any key to continue. ☑ ***Note:*** *If using preprinted stock, ensure that the label area under the sensor is free of preprinted text, graphics or borders.*	SCAN PAPER PRESS ANY KEY <yyy>	This sets the parameter for the 'paper' value - where 'yyy' is a numerical value representing the current sensor reading.
9	Observe the display.	GAP MODE CALIBRATION COMPLETE *- or, for reflective media:* REFLECTIVE MODE CALIBRATION COMPLETE *- or, for continuous media:* CONTINUOUS MODE CALIBRATION COMPLETE	The calibration was successful. ☑ ***Note****: If 'Warning Low Backing' is displayed (most typical with notched media or media on a transparent liner), the message indicates that calibration was successful. For other possible messages see Section 6.2.*
10	Press the ESC Key to exit the menu. If using gap or reflective media, press and hold the FEED Key. *The printer will begin advancing media; allow at least one label gap (or mark) to advance under the sensor.*	READY	The printer is set to begin printing.

5.1.3 Advanced Entry Calibration

Advanced Entry Calibration is an alternate calibration method for special-case media types. This procedure has two basic parts: recording the sensor readings for the label using differing algorithms; and, selecting the best result, re-sampling, and then entering those values.

> *Advanced Entry Calibration will override all previous calibration settings. Use this method ONLY if the Standard Calibration procedure has failed.*

Perform an Advanced Entry Calibration as follows:

Step	Action	Display Message	Comment
1	(Media should be loaded and the 'Sensor Type' set.) Turn 'On' the printer.	UNCALIBRATED	Wait until the printer initializes (about six seconds).
2	Press the MENU Key.	MEDIA SETTINGS	The Menu Window will appear.
3	Press the ENTER Key to enter the Media Settings menu.	MEDIA TYPE	See Section 4.2.2 for menu items.
4	Press the ↓ Key to scroll to 'Sensor Calibration'.	SENSOR CALIBRATION	Press the ESC Key to abort this procedure.
5	Press the ENTER Key.	PERFORM CALIBRATION	You are entering the calibration submenu.
6	Press the ↓ Key to scroll to 'Advanced Entry'.	ADVANCED ENTRY	You are entering Advanced Entry Calibration.
7	Press the ENTER Key.	SENSOR LEVELS	Press the ESC Key to abort this procedure.

Step	Action	Display Message	Comment
8	Press the ↓ Key.	SENSOR GAIN	You are beginning the Advanced Entry Calibration.
9	Press the ENTER Key. Place the label under the Sensor Eye Mark and lower the Head Lift Lever.	GAIN TRAN <yyy> *00 <0 – 32> *- or, for reflective media:* GAIN REFL <yyy> *00 <0 – 32>	If using preprinted media, ensure the label area under the sensor is free of preprinted text, graphics, lines, etc.
10	Press the ENTER Key to select the Gain Number (denoted by an '*') and then record the sensor reading ('yyy') as a **Label Value** in a table similar to the one shown below. Next, press the ↓ Key to increment the Gain Number. Repeat this step to find the Label Value for each of the Gain Numbers (00-32).	GAIN TRAN <255> *00 <0 – 32> *- or, for reflective media:* GAIN REFL <255> *00 <0 – 32>	The sensor reading, where 'yyy' is a numerical value representing the current sensor reading, is useful in locating the best sensor position over the media. ☑ ***Note:*** *Never position the sensor over a perforation when recording a sensor reading.*

Sample table:

Make a table similar to the one shown right, with enough rows to record the data for each of the 33 Gain Numbers.

Gain Number	Label Value	TOF Value	Difference Value
00	255		
01			
02			
…			
32			

Advanced Entry Calibration (continued)

Step	Action	Display Message	Comment
11	Proceed according to the type of media being calibrated: **Die-cut:** a) Strip a label or two from the liner material. b) Reinstall the media. c) Place only the liner under the sensor. d) Position the Sensor Eye Mark over the middle of the liner. **Notched:** Position the Sensor Eye Mark over the center of the notch. **Reflective:** Position the Sensor Eye Mark over the center of the black mark. (The black mark must be facedown to be sensed properly.) Press the ENTER Key to select the Gain Number (denoted by an '*') and then record the sensor reading ('yyy') in your table as a **TOF Value.** Next, press the ↓ Key to increment the Gain Number. Repeat this step to find the TOF Value for each of the Gain Numbers (00-32).	GAIN TRAN <yyy> *00 <0 – 32> *- or, for reflective media:* GAIN REFL <yyy> *00 <0 – 32>	Where 'yyy' is a numerical value representing the current sensor reading: useful in locating the best sensor position. ☑ ***Note:*** *Never position the sensor over a perforation when recording a sensor reading.*

☑ ***Note:*** *Do NOT move the position of the Media Sensor after it has been adjusted.*

Step	Action	Display Message	Comment
12	From the data collected in Steps 10 and 11, where both the sensor readings are above 20, subtract the Label Value from the corresponding TOF Value. Record these as **Difference Values** in the table. From the resulting list, locate the largest Difference Value (see the example below). Its associated Gain Number will provide the best algorithm for your media.	GAIN TRAN <014> *32 <0 – 32> *- or, for reflective media:* GAIN REFL <014> *32 <0 – 32>	Both sensor values must be above 20.

For example, if your compiled data had the values shown in this table, Gain Number 8 would be chosen because it has the highest Difference Value (146), where both the Label Value and the TOF Value are above 20.

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
32	112	14	N/A

Step	Action	Display Message	Comment
13	Using the ↓ Key, select the Gain Number determined in the previous step. Press the ENTER Key to select the setting.	GAIN TRAN <yyy> *08 <0 – 32> *- or, for reflective media:* GAIN REFL <yyy> *08 <0 – 32>	This example uses Gain Number 8. Selection is denoted with an asterisk (*).
14	a) Place the media in the Media Sensor. Record the sensor reading and label it 'P' (paper). b) Place the liner, mark, or notch in the Media Sensor. Record the sensor reading and label it 'G' or 'M' (Gap or Mark). c) Remove all media. Record the sensor reading and label it 'E' (Empty). (See the example below.)	GAIN TRAN <yyy> *08 <0 – 32> *- or, for reflective media:* GAIN REFL <yyy> *08 <0 – 32>	Where 'yyy' is a numerical value representing the current sensor reading.
15	Press the ESC Key followed by the ↓ Key.	SENSOR LEVELS	The sensor readings must now be entered into the printer.

For example, at Gain Number 8, these were the sensor readings for each of the media conditions. (Actual readings will vary.)	Paper	Gap (or Mark)	Empty
	198	084	014

Step	Action	Display Message	Comment
16	a) Press the ENTER Key. b) Using the ↓ Key, set the 'Paper' level to the value determined in the previous step. c) Press the ENTER Key to set the entry (indicated by the '*') and advance the menu. d) Repeat for the 'Gap' (or 'Mark') value, and then the 'Empty' value.	PAPER SENSOR LEVEL P* 198 G*000 E*000 ↓ GAP SENSOR LEVEL P* 198 G*084 E*000 ↓ EMPTY SENSOR LEVEL P* 198 G*084 E*014 *-or, for reflective media:* PAPER SENSOR LEVEL P* 015 G*000 E*000 ↓ GAP SENSOR LEVEL P* 015 G*181 E*000 ↓ EMPTY SENSOR LEVEL P* 015 G*181 E*213	The selection will change to indicate the item for entry.
17	Press the ESC Key to exit the menu. When prompted, press the ENTER Key to save your changes and return to Ready Mode.	SAVE CHANGES ENTER KEY = YES	From 'Ready', press the FEED Key. The printer will advance the next label to the TOF position. If a problem occurs, see the note below.

☑ ***Note:*** *If the Advanced Entry Calibration fails, try the following procedure:*

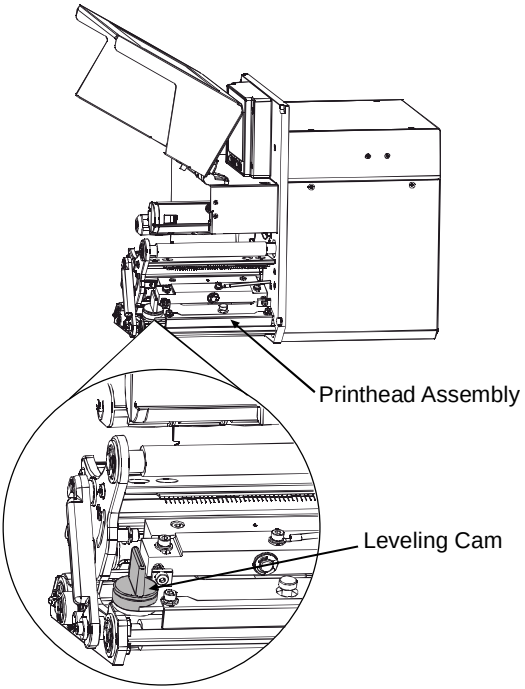
Re-enter the Menu. Go to → `Media Settings` → `Calibration` → `Advanced Entry` → `Sensor Gain` and lower the selected Gain Setting number by one (to desensitize the sensor). Select the new Gain Setting, save the changes, and exit the menu. Test your media at the new setting. If necessary, repeat the procedure until a usable media setting is obtained.

5.2 Printhead Adjustments

To ensure consistent print quality over the wide range of media types and sizes, the printer is equipped with Leveling Cam and Burn Line adjustments.

5.2.1 Leveling Cam Adjustment

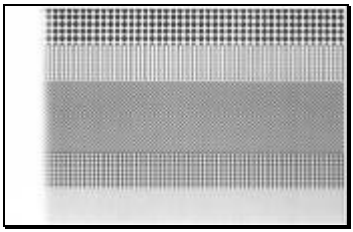
The Leveling Cam adjustment should be made to ensure even print quality when using media that is narrower than the width of the printhead. Perform this adjustment whenever narrower media is installed, as follows:



1. With the media loaded in the printer, download your label format (or use a Test Label format) and begin batch printing.

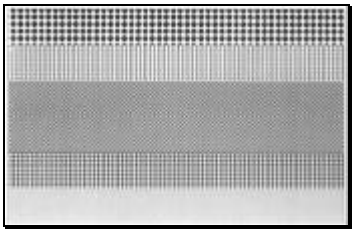
2. While observing the printed labels, rotate the Leveling Cam to an over-adjusted position (see Example 1, below).

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



Example 1 – Over adjustment of the cam:

Too much adjustment produces an image that fades across the label. To correct this, decrease the setting of the Leveling Cam.



Example 2 – Correct adjustment of the cam:

Proper adjustment produces a complete image, with even print contrast across the label (see note below).

☑ ***Note:*** *Under-adjustment of the Leveling Cam can also produce problems including ribbon wrinkling, label tracking, and platen roller and printhead wear.*

5.2.2 Burn Line Adjustment

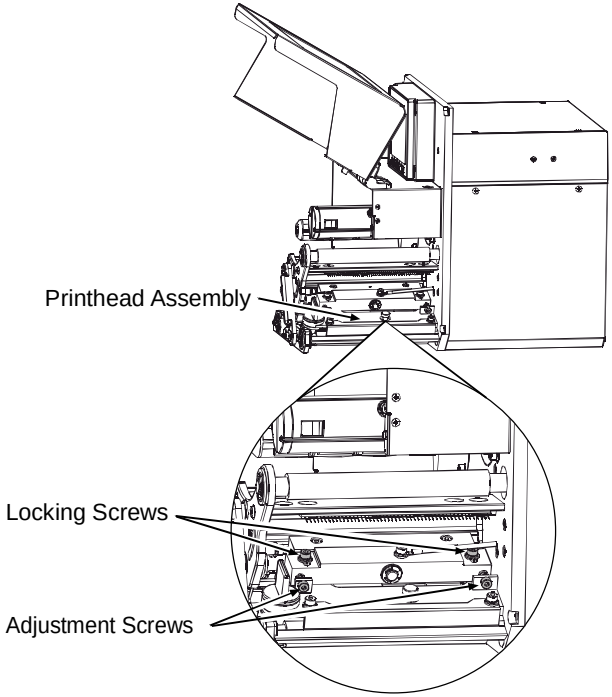
The printer has been adjusted at the factory for strict compliance using 6.5-mil (.0065 inch) media, ensuring print quality on most media types. In extreme cases, however, if media of a different thickness or rigidity is used (for example, heavy tag stock), print quality may be affected. In this case, first try the suggestions in Sections 2.2 and 5.2.1. If print quality remains unacceptable, a Burn Line adjustment may be needed (typically, a thicker media requires a slight forward adjustment, while a thinner media requires a backward adjustment).

☞ *If you have questions, contact a qualified technician or Datamax Technical Support before proceeding.*

Adjust the Burn Line as follows:

1. Load the printer with the media (and ribbon, if required), as described in Section 3.4 (and Section 3.5 for ribbon).

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



3. Turn the Adjustment Screws counter-clockwise to bring the burn line forward, beyond the vertex of the platen roller.

4. Print a Validation Label; see Section 4.4.5. (*The label should have a light, uneven appearance.*)

5. Tighten the Locking Screws until they are 'snug' (that is, tight enough to remove any play in the printhead assembly, yet loose enough to allow the Adjustment Screws to move the printhead).

6. Turn <u>each</u> Adjustment Screw clockwise about a ¼ turn (or 1/8 a turn for finer adjustments, see note below). Print another Validation Label and examine the print quality. Repeat this step until the print is produced with even contrast and acceptable quality across the width of the label.

☑ ***Note:*** *When the Locking Screws are 'snug', turning the Adjustment Screws counter-clockwise will NOT move the printhead <u>outward</u>; if you have adjusted the printhead too far inward, restart the entire procedure.*

7. Tighten the Locking Screws. Print a final Validation Label to verify the adjustment.

5.3 Printhead Replacement

If the printhead becomes damaged, use the procedure below to replace the component.

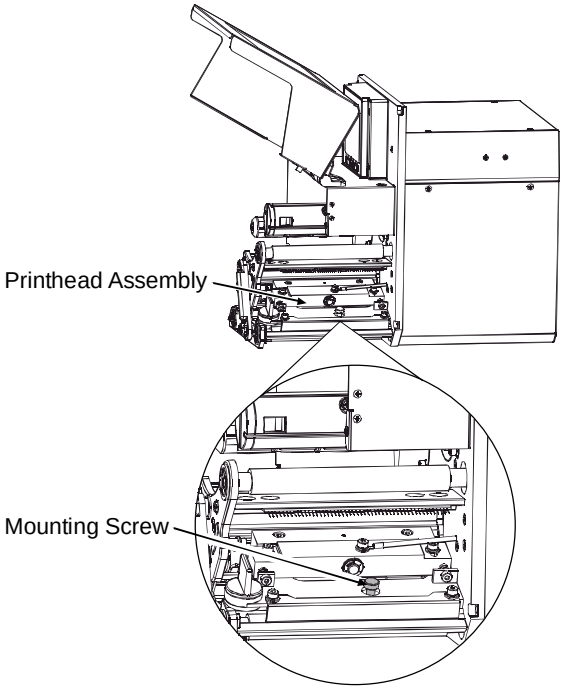
☑ ***Note:*** *Use extreme care when handling a printhead. Follow ESD procedures. Never use a sharp object on the surface. If you have questions, contact a qualified technician or Datamax Technical Support before proceeding.*

Replace the printhead as follows:

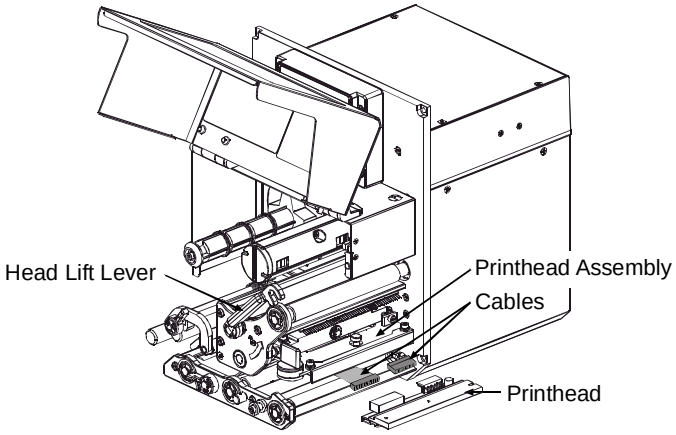
1. Turn 'Off' and unplug the printer. Open the access cover. Remove media and ribbon (if installed).

2. Touch a bare metal part of the printer's frame to discharge any static electricity that may be present on your body.

3. With the Printhead Assembly in the down position, loosen the Mounting Screw (this is a captivated screw; it will remain in the assembly).



4. While holding the Printhead, raise the Head Lift Lever. Carefully disconnect the two Cables and then remove the old Printhead.



5. While carefully holding the new Printhead to protect its surface, connect both Cables.

6. Place the Printhead onto the locating pins (on the underside of the Printhead Assembly) and then secure the Printhead with the Printhead Mounting Screw (do not to over-tighten this screw).

7. Clean the Printhead using alcohol and allow it to dry; see Section 5.4.1.

8. Reload media and ribbon (if removed), lower the Head Lift Lever into the locked position. Plug in and turn 'On' the printer.

9. Print a Validation Label (Section 4.4.5). Examine the printed label and, if necessary, adjust the Print Control/Custom Adjustments/Darkness setting (Section 4.2.3) so that the print contrast (darkness) produced by the new Printhead matches the old Printhead.

☑ ***Note:*** *Following a printhead replacement, a Burn Line adjustment is NOT normally required. However, if print quality has changed, see Section 5.2.2.*

5.4 Maintenance Schedule

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

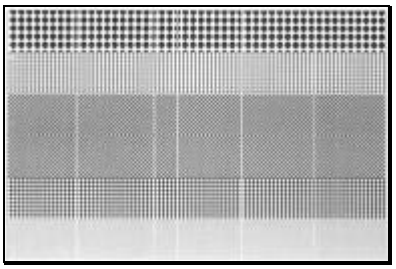
- Isopropyl alcohol
- Cotton swabs
- A clean, lint-free cloth
- Soft-bristle brush
- Soapy water/mild detergent
- Compressed air

For your safety and to avoid damaging the printer, turn 'Off' and unplug the printer before cleaning. Always take proper precautions when using isopropyl alcohol, a flammable liquid.

Recommended Cleaning Schedule		
Area / Item	**Method**	**Interval**
Peel Assembly	Cotton swab dampened with isopropyl alcohol. Remove all build-up. See Section 5.4.3.	Clean after each roll (or box) of labels, or after each roll of ribbon.
Exterior Surfaces	Mild detergent. Remove all build-up. See Section 5.4.5.	As needed.
Media Path / Media Sensor / Peel Bar	Compressed air or a soft brush. Isopropyl alcohol, as needed. Remove all build-up. See Section 5.4.4.	As needed, based on a weekly visual inspection.
Printhead	Cleaning Card and isopropyl alcohol, if needed. Remove all build-up. See Section 5.4.1.	Clean after each roll (or box) of labels, or after each roll of ribbon.
Rollers	Cotton swab dampened with isopropyl alcohol. See Section 5.4.2.	Clean after each roll or box of labels, or after each roll of ribbon.

5.4.1 Cleaning the Printhead

If print quality declines (symptoms may include unreadable bar codes, streaks through printed labels, etc; see below), the typical cause is debris build-up on the printhead. Furthermore, if not removed, this build-up may lead to premature printhead failure.



Faulty Test Pattern Label:

Instead of consistent patterns, streaks indicate a dirty or faulty printhead.

Cleaning should be performed after each roll or box of labels, or after each roll of ribbon, which ever comes first. (The printer can be programmed to prompt you when cleaning is needed; see Printhead Cleaning, Section 4.2.2.)

CAUTION *NEVER use a sharp object to clean the Printhead.*

Clean the printhead as follows:

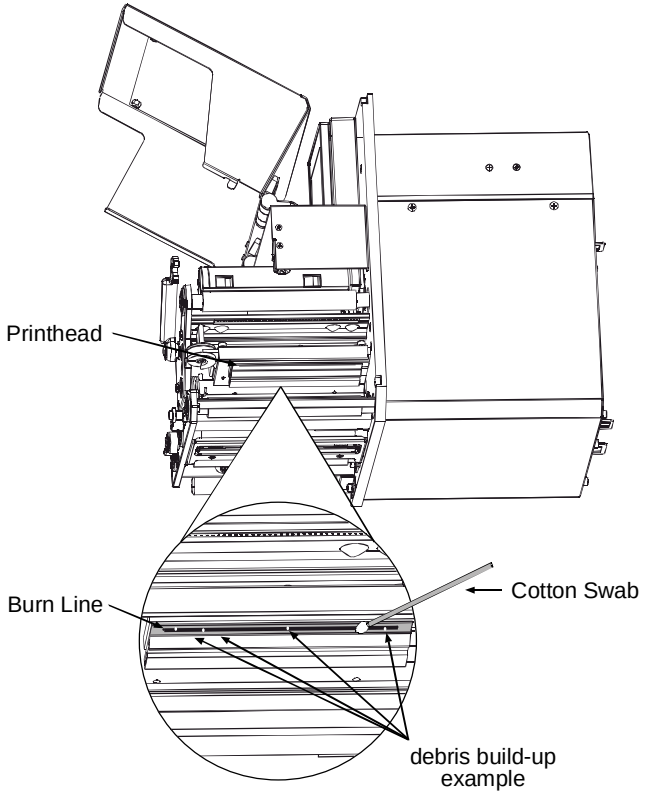
1) Turn 'Off' and unplug the printer. Open the access cover. Raise the Head Lift Lever. **Allow the printhead to cool before proceeding.**

   If using thermal transfer media, move the ribbon away to gain access to the printhead.

2) Using a cotton swab moistened (not soaked) with isopropyl alcohol, gently wipe the entire Printhead surface, paying close attention to the Burn Line and cleaning any areas of debris build-up (see drawing below). Allow the printhead to dry.

3) If removed, reload ribbon and media. Lower the Head Lift Lever to the locked position.

4) Close the cover. Plug in and turn 'On' the printer. Run several sample labels and examine the print quality. If streaks are still present, continue to Step 5.



5) Remove ribbon (if any) and install a Datamax Printhead Cleaning Card, part number 70-2013-01. Lower the Head Lift Lever. Ensure that the Leveling Cam is not engaged; see Section 5.2.1. Close the cover.

6) Press and hold the TEST Key for approximately 4 seconds. (Or, as an alternate method, select 'CLEAN HEAD NOW' in the menu system; see Section 4.2.2.)

   The printer will automatically begin advancing and withdrawing media.

7) In cases of heavy build-up, or where a Heat value of 22 or greater is used for printing, repeat Step 6.

8) Reinstall ribbon and media (if necessary, readjust the Leveling Cam). Lower the Head Lift Lever to the 'locked' position. Close the cover.

   This completes the procedure. Run a few sample labels and examine them; if streaking is still present, see Section 6.1.

5.4.2 Cleaning the Rollers

CAUTION *NEVER use a sharp object to clean the Rollers.*

Rollers contaminated with grit, label adhesive, or ink can cause a reduction in print quality. Label tracking can also be affected. In extreme cases, labels may wrap the rollers. To prevent problems, clean the rollers as follows:

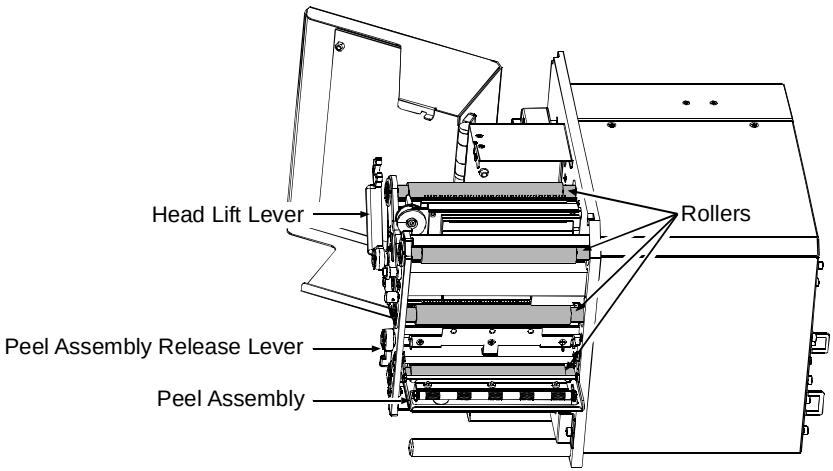
1. Turn 'Off' and unplug the printer. Raise the access cover.

2. Raise the Head Lift Lever. Lower the Peel Assembly Release Lever. Remove media and ribbon.

3. Using a cotton swab dampened with isopropyl alcohol, clean the Rollers. Rotate each roller, wiping and repeating until the entire roller is clean.

4. After allowing the Rollers to dry, replace ribbon and media. Close the Peel Assembly and lower the Head Lift Lever into the locked position.

5. Close the access cover. Plug in and turn 'On' the printer. *This completes the cleaning procedure. Feed several labels to normalize media tracking.*

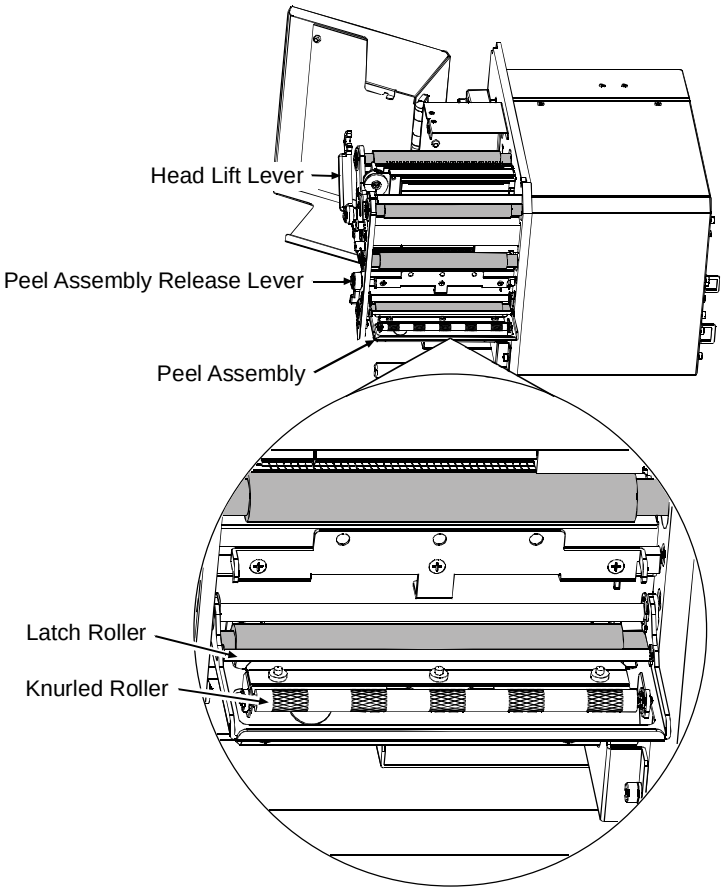


5.4.3 Cleaning the Peel Assembly

Peel Rollers contaminated with grit and label adhesive can reduce the ability of the printer to separate the labels from the backing material. To prevent problems, clean the rollers as follows:

1. Turn 'Off' and unplug the printer. Raise the access cover.

2. Raise the Head Lift Lever. Lower the Peel Assembly Release Lever. Remove media and ribbon.



3. Using a cotton swab dampened with isopropyl alcohol, clean the Latch Roller and the Knurled Roller. Rotate each roller, wiping and repeating until each entire roller is clean. *(Continued next page)*

4. After allowing the rollers to dry, replace ribbon and media. Close the Peel Assembly and lower the Head Lift Lever into the locked position.

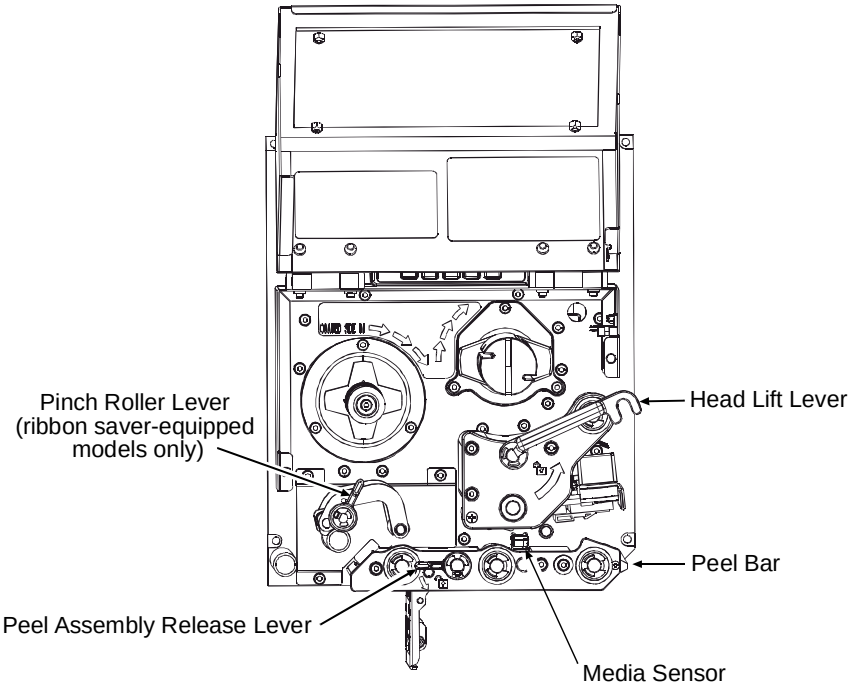
5. Close the access cover. Plug in and turn 'On' the printer. *This completes the cleaning procedure. Feed several labels to normalize media tracking.*

5.4.4 Cleaning the Media Path, Media Sensor, and Peel Bar

When particles such as paper dust accumulate inside the printer, the result can produce small voids in the text, graphics and bar codes. Also, adhesive build-up on the Peel Bar can impair label separation. To prevent problems, clean these areas as follows:

1. Turn 'Off' and unplug the printer. Raise the access cover.

2. Raise the Head Lift Lever. Lower the Peel Assembly Release Lever. Remove media and ribbon.



(Continued next page)

3. Using compressed air or a soft brush, clean the media and ribbon path including the Media Sensor and Peel Bar. Use a cotton swab dampened with isopropyl alcohol as needed.

4. After allowing the components time to dry, replace ribbon and media. Close the Peel Assembly and lower the Head Lift Lever into the locked position.

5. Close the access cover. Plug in and turn 'On' the printer. *This completes the procedure. Feed several labels to normalize media tracking before printing.*

5.4.5 Cleaning Exterior Surfaces

The stainless steel surfaces of the printer should be cleaned using a general-purpose cleanser. Never use abrasive cleansers or solvents. To clean, turn 'Off' and unplug the printer. Then, using a soft cloth or sponge dampened with the cleanser, wipe the exterior surfaces until clean.

5.5 Application Program Updates

The printer stores its application program in Flash memory on the Main Logic Card. The printer allows updates to this program version through any of its communications interfaces. Updates can be found at ftp://ftp.datamaxcorp.com.

Before beginning an update, identify the current version of the printer's application program by printing a Configuration Label (see Section 4.4.2). Compare that version string to those filenames available from the FTP site (see above) and then download the desired file onto your computer's hard drive.

WARNING *Should an error occur during the download (see Section 5.5.2), the update is aborted. If this process did not reach 'Erasing Flash' or 'Updating Software', the previous program is left intact; otherwise, a successful download must be completed before the printer is operable.*

5.5.1 Updating the Application Version

☑ ***Note:*** *If Security has been enabled, disable the feature before proceeding.*

Step	Display Message	Operator 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 A4212tb˜1.zs lpt1 (Where 'lpt1' is the host computer's port; however, this selection can differ to include a serial or other port, as the printer is equipped.) The Comm Indicator will flash as data is received.
2	UPGRADING SOFTWARE	No action required.	The new application program is being stored and verified.
3	A4212 8.00 10/01/2003	No action required.	The printer has automatically reset and is now displaying the new firmware version.
4	READY	No action required.	The new application is now running. ☑ ***Note:*** *If 'Uncalibrated' is displayed, the printer must be calibrated (see Section 5.1).*

5.5.2 Possible Problems during an Update

The following is list of possible error messages when downloading:

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

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

2) Use the Datamax Printer Driver (on the Accessories CD-ROM) – "Device Setting / Send File to Printer" function.

Application Update Error Messages	
Display 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 Firmware downloaded was not compatible with the printer's Main Logic Card. The firmware used was for a different class model and not supported by this boot loader version. See Configuration Level, Section 4.2.5.
INVALID SOFTWARE DATA REJECTED	The printer detected an error in the download. 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. Recheck cabling and port setting.
SOFTWARE MISMATCH DATA REJECTED	Software level not authorized for this printer (See Section 4.2.5, Configuration Level/Printer Key.)

5.6 Boot Loader Program Updates

The printer stores the Boot Loader Program in Flash memory on the Main Logic Card. A feature allows updates to this program via the printer's interface port. Updates can be found at ftp://ftp.datamaxcorp.com.

WARNING

If power is lost while 'Upgrading Software' is displayed, the printer will become non-functional and must be returned to the factory for programming or the main logic board must be replaced.

Before performing the Boot Loader update, identify the printer's current version. Print a Configuration Label (see Section 4.4.2) and compare that version string to those available from our FTP site. Download the desired version onto your computer's hard drive. To update the Boot Loader Program:

☑ ***Note:*** *If Security has been enabled, disable the feature before proceeding.*

Step	Display Message	Operator 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~1.bs lpt1 (Where 'lpt1' is the host computer's output port; however, your selection can differ to include a serial or other port, as the printer is equipped.) The Comm Indicator will flash as data is received.
2	UPGRADING SOFTWARE	No action required.	The new program is being stored and verified.
3	A4212 3.173 4/01/2003	No action required.	The printer has automatically reset.
4	READY	No action required.	The new application is now running. ☑ ***Note:*** *If 'Uncalibrated' is displayed, the printer must be calibrated (see Section 5.1).*

Troubleshooting

6.1 Problem Resolution

The following table covers problems that may not generate a printer error message.

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

If experiencing this problem…	Try this solution…
Can not communicate through the parallel port:	Watch the display. The Comm Indicator (see Section 4.1) will flash as data is received. If COMM does not appear, check the parallel cable type; also, verify the protocol and port settings of the printer and host.
The graphic display is blank, but the blue backlighting is 'On':	The display contrast may set too low. Turn the printer 'Off' and 'On.' Wait for ten seconds. (If the printer is equipped with at network card wait for two minutes.) Press and hold the MENU Key. (It can take up to 15 seconds to cycle through the contrast range, see Section 4.1 for the menu key layout.)
Erratic feeding:	The printer may require a Quick Media Calibration; see Section 5.1.1.
Erratic printing (instead of the label format, strange characters are printed):	• The printer may be in Hex Dump Mode; see Section 6.3. • If using serial communications, check the host and printer port settings; the printer may be set to eight data bits while the host is set to 7 (or vice versa).

If experiencing this problem…	Try this solution…
Light print on the right or left side of the label:	• The Leveling Cam may be incorrectly adjusted; see Section 5.1.1. • The Head Lift Lever may not be locked; see Section 3.4. • The Platen Roller may be dirty or worn; see Section 5.4.2.
Missing information in the printed label:	• Check the label format for character placement outside the dimensions of the label; all row/column values must allow enough space for the height/length of the characters and bar codes to be printed within the format size. • Available memory may have been exceeded by the requirement of the label format. Try reducing the memory allocated to either the internal module or scaleable font caches; see System Settings / Memory Settings, Section 4.2.5. • If using serial communications, ensure that the interface cable meets the requirements found in Section 3.3.1.
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 the menu for Print Control / Column Offset and Print Control / Custom Adjustments / Column Offset; see Section 4.2.3.
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 Programmer's Manual* for details.

If experiencing this problem…	Try this solution…
No power (the display is 'Off'):	• Verify that the AC power cord is connected to an outlet and to the printer; also, ensure the power switch is 'On'. • Verify that the AC outlet is functioning, or try connecting the printer to different AC circuit. • The AC cord may be damaged; replace it. • The line fuse may be blown; call for service.
Nothing is printing (labels advance normally, but no image is printed) using *direct thermal media*:	Test the labels to make sure they react to heat. If the labels do react to heat, try increasing the Heat setting (see Section 4.2.3); it may be too low. Make the adjustment in the software program or through the User Interface. (The same functional commands from the host computer may override the menu settings; see Section 4.2.6.) If the labels do not react to heat, replace the media being used with direct thermal stock.

If experiencing this problem…	Try this solution…
Nothing is printing (labels advance normally, but no image is printed) using *thermal transfer media*:	Examine the used ribbon for traces of an image. • If there <u>is</u> an image on the used ribbon: Verify that the ribbon was properly loaded per Section 3.5. If properly loaded, the ribbon is the wrong type. (To verify the inked side, press the adhesive backing of a label against the ribbon surface. Ink will only lift from the coated side of the ribbon.) Clean the printhead (see Section 5.4.1); then replace the ribbon with the correct type for the printer, Section 3.5. • If there <u>is not</u> an image on the used ribbon: Run any Test Label; see Section 4.4. If an image printed, then check the protocol and port settings for both the printer and host. These must match. The Heat setting (see Section 4.2.3) may be too low. Make an adjustment in the software program or through the User Interface. (The same functional commands from the host computer may override the menu settings; see Section 4.2.6.) The media/ribbon combination may be incorrect. Contact your Media Representative. The printhead or printhead cable(s) may be loose; power 'Off' the printer then reconnect; see Section 5.3 for locations.

If experiencing this problem…	Try this solution…
Nothing happens when trying to print using a software program:	• Ensure that the printer is at READY. • Observe the display, if COMM is not indicated after the format is sent then check the protocol and port settings between the printer and host. • Ensure the interface cable meets the requirements found in Section 3.3.1. • Observe the display, if COMM is indicated after the format is sent then enter Menu / Communications / ESC Sequences and select the 'Disable' setting.
Poor print quality:	• The Printhead may need cleaning; see Section 5.4.1. • Adjust the Heat and Print Speed settings through the User Interface or by host commands; see Section 4.2.3. (The same functional commands from the host computer may override the menu settings; see Section 4.2.6.) • The media/ribbon combination may not be compatible; see Section 2.2. • The Leveling Cam may be incorrectly adjusted; see Section 5.2.1. • The Platen Roller may be dirty or worn; see Section 5.4.2. • The Burn Line may need adjusting; see Section 5.2.2. • The printhead may be defective, call for service.
Skips labels when printing:	• Quick Media Calibration may be needed; see Section 5.1.1. • The Media Sensor may be out of position; readjust the position; see Section 3.6. • The format may be within 1/8 inch of the label's edge. Try reducing or moving the format slightly.

6.2 Fault and Warning Messages

All printer functions are internally monitored. When a problem (Fault) or a potential problem (Warning) is detected, a corresponding message will the displayed (see Section 4.1.4) if not within a branch of the menu system or in Test Mode. These messages, along with possible solutions, are described below.

Fault Messages:

Fault Messages receive the highest display priority. If more than one fault is detected the display will cycle between messages.

☑ ***Note:*** *To return to normal operation following a fault, the fault must be corrected and then the FEED Key must be pressed to clear the condition.*

Printer Fault Messages		
Display Message	**Description**	**Possible Solution(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.
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 media sensor during the appropriate calibration step; also ensure that the sensor is free of debris. Retry the calibration. If the problem persists, try the 'Advanced Entry Calibration'; see Section 5.1.3.

Printer Fault Messages *(continued)*		
Display Message	**Description**	**Possible Solution(s)**
GAP 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 steps; also ensure that no labels are stuck in the media sensor. Retry the calibration. If the problem persists, call for service.
HEAD CLEANING FAULT	The scheduled printhead cleaning has been exceeded by an amount equal to three times the pre-programmed distance.	Press and hold the TEST Key, or select 'CLEAN HEAD NOW'. See Section 5.4.1 for details.
HEAD/COVER UP FAULT	The printhead is in the 'up' position or the Cover Sensor is open.	Lower and lock the Head Lift Lever; see Section 3.4; or, close the Access Cover.
OUT OF STOCK	The printer cannot detect media.	Try the following: 1) Load media. 2) Ensure that the labels are passing through the Media Sensor. 3) Readjust the Media Sensor over the TOF mark; see Section 3.6. 4) If using media with large gaps, adjust the Paper Out Distance; see Section 4.2.2. 5) Calibrate the printer; see Section 5.1.

Printer Fault Messages *(continued)*		
Display Message	**Description**	**Possible Solution(s)**
POSITION FAULT	Two possible causes: (1) The printer was powered-off or reset during a ribbon, out of stock or TOF fault; or (2) the printer was unable to complete the Media Calibration.	Depending upon the cause: (1) Press the FEED Key in an attempt to identify and then clear the fault; or (2) if necessary, calibrate the printer; see Section 5.1.
PRINT ENGINE FAULT	The printer has detected a problem within the print logic.	Try cycling the printer power 'Off' and 'On'. If the fault does not clear, call for service.
RAM FAULT	The system has detected a RAM failure.	Try cycling the printer power 'Off' and 'On'. If the fault does not clear, call for service.
REFLECTIVE MODE CANNOT CALIBRATE	Consistently low sensor readings were detected.	Press any key to continue. Ensure that the reflective mark was inserted facedown in the media sensor during the appropriate calibration step; 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 an 'Advanced Entry Calibration'; see Section 5.1.3.

Printer Fault Messages *(continued)*		
Display Message	**Description**	**Possible Solution(s)**
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 steps; also ensure that no labels are stuck in the media sensor. Retry the calibration. If the problem persists, call for service.
RIBBON FAULT	The ribbon sensor values have changed, or the printer detects no, or only sporadic, ribbon supply hub movement.	Try the following: 1) Ensure that ribbon is correctly installed and that the Head Lift Lever is latched. 2) Check the ribbon supply and ribbon take up hubs for obstructions that may be inhibiting movement. 3) Ensure that the ribbon core fits snugly on the ribbon supply hub. 4) Ensure that the ribbon is not slipping (usually caused by an incorrect media and ribbon combination).
RIBBON SAVER FAULT	The Printhead was not lifted or lowered as expected.	Enter the menu (or use software) and temporarily disable the option to continue printing. Call for service.
TEMPERATURE FAULT	The printer has shutdown to allow the printhead temperature to cool.	Turn 'Off' the printer and wait until the printhead cools to prevent permanent damage.

Printer Fault Messages *(continued)*		
Display Message	**Description**	**Possible Solution(s)**
TOP OF FORM FAULT	The printer could not find the TOF mark within the maximum label length setting or it found a TOF in an unexpected place. ☑ ***Note:*** *When the SENSOR TYPE is set to REFLECTIVE, 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 5.1. 2) The Media Sensor may be out of position. Readjust it; see Section 3.6. 3) The media may not be properly loaded. Reload media, also ensure that the Media Guide is positioned properly; see Section 3.4. 4) The Leveling Cam may be improperly adjusted; see Section 5.2.1. 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 Head Lift Lever may not be latched; close and lock it.

Warning Messages:

Warning Messages are displayed for approximately three seconds. In the case of multiple messages, the warning carrying the highest priority is displayed.

Printer Warning Messages		
Display 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	There is only a small difference between the measured 'empty' and 'gap' sensor readings.	Transparent backing or notched media typically gives this indication. In this case, there may be a slight delay in the 'Out of Stock' indication, after the media supply is emptied; no action is required.
GOODBYE	Power has been removed and shutdown is in progress.	The printer power switch was turned 'Off', the line fuse has blown, or AC line voltage has been 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 for details.
HOST CHANGES PENDING	The host has pending configuration changes that will not take effect until a 'host reset command' is issued.	To save your changes, send a host reset command (in DPL), or to discard changes perform a soft reset; see Section 6.4.1.
LOW VOLTAGE	The printer has detected a low operating voltage.	Possible low or fluctuating line voltage level. Try moving the printer to another outlet. When more than 50% black is being printed, try reducing the Heat Value or the size of the black image. If the condition persists, call for service.

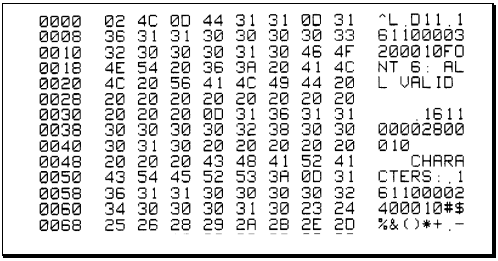
Printer Warning Messages *(continued)*		
Display Message	**Description**	**Action(s)**
RTC RAM FAILURE	The printer was unable to save settings in permanent memory.	Possible faulty Main Logic Card. If the condition persists, call for service.
TEMPERATURE PAUSE	A high printhead temperature has been detected.	No action required. Printing will resume after the printhead cools.

6.3 Hex Dump Mode

The 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 Programmer's Manual* is an essential reference. This output can be used for debugging the label format. In addition, by repeatedly sending a format, this mode can uncover handshaking problems (if they exist). Handshaking problems are identified by sections of missing data in the character string.

To begin, go to the Diagnostics menu and enable Hex Dump Mode; see Section 4.2.7. Exit the menu and save the changes. Now, 'HEX DUMP MODE' will be indicated by the display and all data sent to the printer will now be output in hexadecimal code, along with the printable ASCII equivalents.

The figure below is a sample Hex Dump Label. After sending a label format to the printer, the hex code output will be immediate. As a final note, many software programs use bit mapping to construct the label, making diagnosis difficult. Contact Datamax Technical Support with any questions.



☑ ***Note:*** *To return to Ready Mode, re-enter the Diagnostics Menu and disable the Hex Dump Mode, exit the menu and save the changes.*

6.4 Resetting the Printer

Depending upon the method used, there are three possible reset levels:

6.4.1 Soft Reset

To clear the printer of any temporary host settings:

With the printer 'On', press and hold the CANCEL Key for approximately four seconds.

6.4.2 Level One Reset

To return the printer to factory default settings and, if saved, to restore the Factory Setting File:

1. Turn 'Off' the printer.

2. Press and hold the PAUSE and CANCEL Keys while turning 'On' the printer; continue to depress the keys until the 'SYSTEM RESET' message flashes.

☑ ***Note:*** *This reset has the same effect as the System Settings / Set Factory Defaults selection in the menu system. (See Section 4.2 for a listing of the factory default settings and Section 4.2.5 for information about the Factory Setting File.)*

6.4.3 Level Two Reset

To return the printer to factory default settings, and to clear all the calibration and adjustment parameters:

1. Turn ‘Off’ the printer.

2. Press and hold the PAUSE, FEED, and CANCEL Keys while turning ‘On’ the printer; continue to depress the keys until the ‘SYSTEM RESET’ message flashes.

> ☑ ***Note:*** *After executing a Level 2 Reset, calibration must be performed; see Section 5.1. A listing of the factory default settings can be found in Section 4.2.*

Specifications

Unless noted, the following specifications pertain to all A-Class models.

Bar Codes (See Appendix B for details.)

Code 39, Interleaved 2 of 5, Code 128 A, B & C, Codabar, UPC-A, UPC-E, UPC 2 & 5 digit addendums, EAN-8, EAN-13, UCC/EAN Code 128 Random Weight, Code 93, MSI Plessey, Postnet, Telepen, UPS MaxiCode, PDF417, DataMatrix, Aztec, QR Code, MicroPDF417, USD 8, RSS, UCC/EAN Kmart non EDI, TLC39, EAN 128 w/auto subset switching, and Code 128 w/auto subset switching.

☑ ***Note:*** *Many bar codes carry trade names, yet they are composed of derivatives of a generic symbology structure. If you have questions regarding a specific code not found in the list above, contact Datamax for details.*

Fonts

9 Bit-Mapped Fonts, rotatable 0, 90, 180, 270 degrees
CG Triumvirate™ Scaleable Font
CG Triumvirate Bold Condensed™ Scaleable Font

☑ ***Note:*** *CG Triumvirate and CG Triumvirate Bold Condensed Scaleable Fonts do not support the Unicode code page.*

Communications

Interfaces:	(2) EIA RS-232 DB9 Serial (Port A is configurable for RS-422/RS-485 operation.) (1) IEEE 1284 Compliant Parallel (1) Version 1.1 Compliant USB
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 / 180 - 264 VAC @ 47 - 63 Hz, auto-ranging		
Power Consumption:	*Model* - A-4xxx	*Typical Operating* - 90 Watts	*Standby* - 10 Watts
Grounding:	Unit must be connected to a properly grounded circuit.		

Environmental

Operating Temperature:	40° F - 100° F (4°C - 38° C)
Storage Temperature:	-40°F - 150°F (-40° C - 60° C)
Relative Operating Humidity:	10% - 90% (non-condensing)
Relative Storage Humidity:	5% - 95% (non-condensing)
Dust:	Non-conducting, non-corrosive
Electromagnetic Radiation:	Moderate RF fields can be tolerated

Mechanical

Height:	*Model* - A-4xxx	*Inches* - 11.81	*Centimeters* - 30
Width:	A-4xxx	9.67	24.6
Depth:	A-4xxx	15.35	39
Weight:	*Model* - A-4xxx	*Pounds* - 34	*Kilos* - 15.3

Printing

Type: Direct Thermal or (optional) Thermal Transfer

Speed Ranges:

Model -	*Inches Per Second* -	*MM Per Second* -
A-4212	2 - 12	50 - 304
A-4310	2 - 10	50 - 254
A-4408	2 - 8	50 - 203
A-4606	2 - 6	50 - 152

Resolution:

Model -	*Dots Per Inch* -	*Dots Per MM* -
A-4212	203	8.0
A-4310	300	11.8
A-4408	406	16.0
A-4606	600	23.6

Nominal Dot Size:

Model -	*Inch X Inch* -	*MM X MM* -
A-4212	.0043 X .0052	.11 X .13
A-4310	.0027 X .0043	.07 X .11
A-4408	.0013 X .0018	.05 X .07
A-4606	.0008 X .0015	.03 X .06

Maximum Print Width:

Model -	*Inches* -	*Millimeters* -
A-4212	4.10	104.0
A-4310	4.16	105.7
A-4408	4.10	104.0
A-4606	4.16	105.7

Print Length Range: .25” – 99” (6 mm – 2500 mm) All Models.

Print Justification: Dependant upon model designation, where Right Hand (RH) is right justified and Left Hand (LH) is left justified.

Media Edge to Printhead Dot 1:

Model -	*RH Designation* -	*LH Designation* -
A-4212	.070” (1.78 mm)	.070” (1.78 mm)
A-4310	.070” (1.78 mm)	0
A-4408	.070” (1.78 mm)	.070” (1.78 mm)
A-4606	.070” (1.78 mm)	0

Protection: Thermistor sensor automatically pauses printing at high temperature detection; printing resumes upon cool-down.

Flash Memory: 4 MB

DRAM Memory: 16 MB

Applicator Interface: Inputs: Optocoupler
Outputs: Transistor
5 VDC, fused (resettable) @ 0.75 amps
24 VDC, fused (resettable) @ 1.6 amps

Media and Ribbon Requirements

Media Types [1]: Roll-Fed, Die-Cut, Continuous, and Fan-Fold. Flat on the printable side and with no more than .0007" (.018 mm) protrusions on the opposite side.

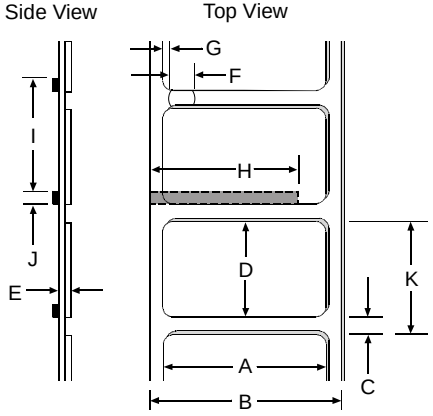
Ribbon Core: 1.010" ± .006" (25.6 mm ± .2 mm) inner diameter. Core not to protrude beyond ribbon edge.

Ribbon Width Range [2]: 1.0" – 4.5" (25.4 mm – 114.3 mm)

Ribbon Length [2]: 1968' (600 meters) maximum

[1]Wound out labels only.

[2]'Coated Side In' and 'Coated Side Out' ribbons are NOT interchangeable, and are dependent upon the Ribbon Supply Hub type installed in the printer. In addition, ribbon width should slightly exceed label width (including the backing material).



Media Dimensions			
Designator	**Description**	**Minimum**[3]	**Maximum**[3]
		A-4xxx	**A-4xxx**
A	label width	1.00	4.65
B	liner width	1.00	4.65
C	gap (or notch) between labels[5]	.100	–
D	label length[5]	.250	.250
E	media thickness	.0025	.0100
F	notch opening width	.200	.500
G	distance from the media's edge to the media sensor aperture	.2	2.25
H	reflective (black) mark width[4]	.500	4.65
I	distance between reflective marks[5]	.500	–
J	reflective mark length[5]	.100	–
K	label repeat distance[5]	.350	–

[3] Units of measure given in inches and referenced by the direction of label travel.
[4] 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.
[5] The maximum allowable length of the combined label and gap (or mark) measurement cannot exceed 99.99 inches.

Approved Media

Specially formulated for optimum print quality, maximum printhead life, and warranty coverage, *DATAMAX*® brand media and ribbons must be used. The use of non-Datamax materials may affect the print quality, performance, and life of the printer or its components (see the Warranty Statement). Consult Section 2.2 for an overview of media and ribbon types. For a current list of approved media and ribbons, contact a Media Representative at (407) 523-5650.

Appendix

ASCII Control Code Chart

	Char	Dec	Hex	Char	Dec	Hex	Char	Dec	Hex	Char	Dec	Hex
Ctrl @	NUL	0	00		32	20	@	64	40	`	96	60
Ctrl A	SOH	1	01	!	33	21	A	65	41	a	97	61
Ctrl B	STX	2	02	“	34	22	B	66	42	b	98	62
Ctrl C	EXT	3	03	#	35	23	C	67	43	c	99	63
Ctrl D	EOT	4	04	$	36	24	D	68	44	d	100	64
Ctrl E	ENQ	5	05	%	37	25	E	69	45	e	101	65
Ctrl F	ACK	6	06	&	38	26	F	70	46	f	102	66
Ctrl G	BEL	7	07	‘	39	27	G	71	47	g	103	67
Ctrl H	BS	8	08	(	40	28	H	72	48	h	104	68
Ctrl I	HT	9	09	)	41	29	I	73	49	I	105	69
Ctrl J	LF	10	0A	*	42	2A	J	74	4A	j	106	6A
Ctrl K	VT	11	0B	+	43	2B	K	75	4B	k	107	6B
Ctrl L	FF	12	0C	,	44	2C	L	76	4C	l	108	6C
Ctrl M	CR	13	0D	-	45	2D	M	77	4D	m	109	6D
Ctrl N	SO	14	0E	.	46	2E	N	78	4E	n	110	6E
Ctrl O	SI	15	0F	/	47	2F	O	79	4F	o	111	6F
Ctrl P	DLE	16	10	0	48	30	P	80	50	p	112	70
Ctrl Q	DC1	17	11	1	49	31	Q	81	51	q	113	71
Ctrl R	DC2	18	12	2	50	32	R	82	52	r	114	72
Ctrl S	DC3	19	13	3	51	33	S	83	53	s	115	73
Ctrl T	DC4	20	14	4	52	34	T	84	54	t	116	74
Ctrl U	NAK	21	15	5	53	35	U	85	55	u	117	75
Ctrl V	SYN	22	16	6	54	36	V	86	56	v	118	76
Ctrl W	ETB	23	17	7	55	37	W	87	57	w	119	77
Ctrl X	CAN	24	18	8	56	38	X	88	58	x	120	78
Ctrl Y	EM	25	19	9	57	39	Y	89	59	y	121	79
Ctrl Z	SUB	26	1A	:	58	3A	Z	90	5A	z	122	7A
Ctrl [	Esc	27	1B	;	59	3B	[	91	5B	{	123	7B
Ctrl \	FS	28	1C	<	60	3C	\	92	5C	|	124	7C
Ctrl]	GS	29	1D	=	61	3D	]	93	5D	}	125	7D
Ctrl ^	RS	30	1E	>	62	3E	^	94	5E	~	126	7E
Ctrl _	US	31	1F	?	63	3F	_	95	5F		127	7F

ASCII Control Code Chart (continued)

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

Appendix

Available Fonts and Bar Codes

All character fonts and bar codes available with the printer are described in this section. Each font and bar code has a name associated with it for use in programming. Human-readable fonts have numeric names, while bar code fonts have alpha names. Consult the *Class Series Programmer's Manual* for detailed information.

Fonts

Fonts 0 through 8 use the slash zero (Ø) convention for distinguishing between the number zero and the letter O. The slash can be removed with the 'z' label-formatting command. These fonts are non-proportional (monospaced): each character takes the same amount of space for printing.

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

Font	Valid ASCII Characters
0	32-127, 255
1	32-168, 171, 172, 225, 255
2	32-168, 171, 172, 225, 255
3	32, 35-38, 40-58, 65-90, 128, 142-144, 146, 153, 154, 156, 157, 165, 168, 225, 255
4	32, 35-38, 40-58, 65-90, 128, 142-144, 146, 153, 154, 156, 157, 165, 168, 225, 255
5	32, 35-38, 40-58, 65-90, 128, 142-144, 146, 153, 154, 156, 157, 165, 168, 225, 255
6	32, 35-38, 40-58, 65-90, 128, 142-144, 146, 153, 154, 156, 157, 165, 168, 225, 255
7	32-126
8	32, 48-57, 60, 62, 67, 69, 78, 83, 84, 88, 90
9	32-126, 128-169, 171-173, 181-184, 189, 190, 198, 199, 208-216, 222, 224 - 237, 241, 243, 246-250

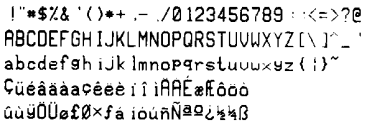
The table below lists the font sizes; the numbers indicate the number of dots.

Font	Height	Width	Spacing
0	7	5	1
1	13	7	2
2	18	10	2
3	27	14	2
4	36	18	3
5	52	18	3
6	64	32	4
7	32	15	5
8	28	15	5

☑ **Note:** The Euro currency character (€) has been added to Fonts 0 – 6.

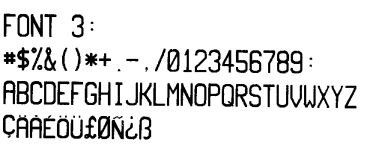
Font 0: 96-character alphanumeric, upper and lower case.

Font 1: 145-character upper and lower case alphanumeric with descenders and ascenders.



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

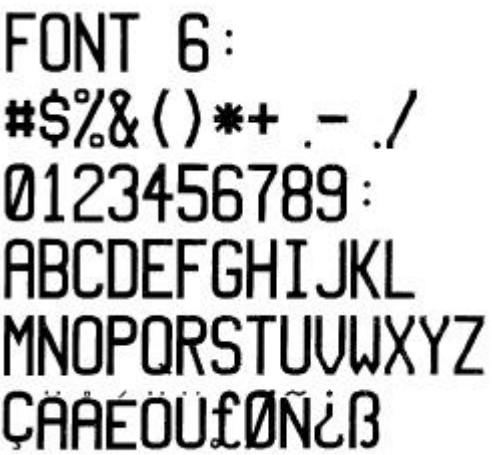
Font 3: 62-character alphanumeric, uppercase.



Font 4: 62-character alphanumeric, uppercase.

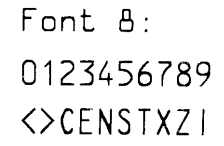
Font 5: 62-character alphanumeric, uppercase.

Font 6: 62-character alphanumeric, uppercase.



Font 7: OCR-A, size I.

Font 8: OCR-B, size III.



Font 9: Internal Triumvirate font. The number in the bar code height field sets the point sizes. Larger point sizes can be obtained by increasing the height and width multipliers.

Bar Code Summary Data

Bar Code fonts (Bar Code ID) have alpha names: Lowercase alpha names only print bar codes; uppercase alpha names print bar codes with a human-readable interpretation. Visual samples are included. See the *Class Series Programmer's Manual* for details.

Bar Code ID	Symbology	Length	Check-sum	Valid ASCII Characters, decimal value representation
A/a	Code 39	Varies	No	32, 36, 37, 42, 43, 45-57, 65-90
B/b	UPC-A	11	Yes	48-57 Numeric only. Option V used in the 6th & 7th position
C/c	UPC-E	6	Yes	48-57 Numeric only
D/d	Interleaved 2 of 5 (I2 of 5)	Varies	No	48-57 Numeric only
E/e	Code 128	Varies	M-103	32-127
F/f	EAN-13	12	Yes	48-57 Numeric only. Option V used in 7th & 8th position
G/g	EAN-8	7	Yes	48-57 Numeric only
H/h	HBIC	Varies	M-43	32, 36-39, 42, 43, 45-57, 65-90
I/i	Codabar	Varies	No	36, 43, 45-58, 65-68
J/j	Interleaved 2 of 5 w/ a modulo 10 checksum	Varies	M-10	48-57 Numeric only
K/k	MSI Plessey	Up to 14	M-10	48-57 Numeric only. Option + is last character for 2nd M-11 checksum
L/l	Interleaved 2 of 5 w/ modulo 10 checksum & bearer bars	13	M-10	48-57 Numeric only
M/m	2 digit UPC addendum	2	Yes	48-57 Numeric only
N/n	5 digit UPC addendum	5	Yes	48-57 Numeric only
O/o	Code 93	Varies	No	35-38, 42-58, 65-90, 97-122
p	Postnet	Varies	Yes	48-57 Numeric only
Q/q	UCC/EAN 128	19	Yes	48-57 Numeric only
R/r	UCC/EAN 128 K-Mart non-EDI	18	Yes	48-57 Numeric only
S/s	UCC/EAN 128 Random Weight	34 +	Yes	48-57 Numeric only
T/t	Telepen	Varies	Yes	Alphanumeric
U	UPS MaxiCode	84	Yes	Alphanumeric
u	UPS MaxiCode w/ Byte Count	Specified	Yes	Alphanumeric
v	FIM	1	No	A, B, C, D
z	PDF-417	Varies	Yes	All
Z	PDF417 w/ Byte Count	Specified	Yes	All
W1c	DataMatrix	Varies	Yes	All 8-bit values
W1C	DataMatrix w/ Byte Count	Specified	Yes	All 8-bit values
W1d	QR Code – Auto format	Varies	Yes	Alphanumeric
W1D	QR Code – Manual format	Varies	Yes	Single-byte or Kanji double-byte

Bar Code ID	Symbology	Length	Check-sum	Valid ASCII Characters, decimal value representation
W1f	Aztec	Varies	Yes	All 8-bit values
W1F	Aztec w/ Byte Count	Specified	Yes	All 8-bit values
W1G/g	USD-8 (Code 11)	Varies	Yes	45, 48-57
W1I	EAN128 (w/auto subset switching)	Varies	Yes	32-127
W1J	Code 128 (w/auto subset switching)	Varies	Yes	32-127
W1k	RSS (six types)	Varies	Yes	Numeric / Alphanumeric (type dependant)
W1R	UCC/EAN Code 128 K-MART NON EDI	18	Yes	48-57 Numeric only
W1t	TCIF Linked Barcode 3 of 9 (TLC39)	Varies	Yes	Alphanumeric
W1z	MicroPDF417	Varies	Yes	All 8-bit values
W1Z	MicroPDF417 w/ Byte Count	Specified	Yes	All 8-bit values

Visual samples of some of the barcodes listed above are included below:

Bar Code A: Code 39

Bar Code B: UPC-A

Bar Code C: UPC-E

Bar Code D: Interleaved 2 of 5

Bar Code E: Code 128

Bar Code F: EAN-13

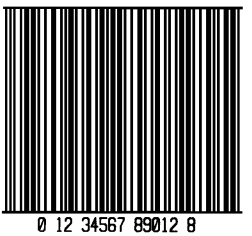
Bar Code G: EAN-8

Bar Code H: Health Industry Bar Code (HBIC)

Bar Code I: Codabar

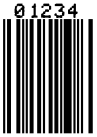
Bar Code J: Interleaved 2 of 5 w/modulo 10 checksum

Bar Code K: Plessey



Bar Code L: Interleaved 2 of 5 w/modulo 10 checksum and shipping bearer bars

Bar Code M: 2 Digit UPC addendum

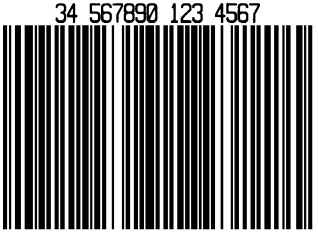


Bar Code N: 5 Digit UPC addendum

Bar Code O: Code 93

Bar Code p: Postnet

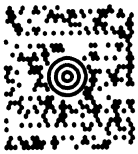
Bar Code Q: UCC/EAN Code 128



Bar Code R: UCC/EAN Code 128
KMART NON EDI

Bar Code S: UCC/EAN Code 128
Random Weight

Bar Code T: Telepen



Bar Code u: UPS MaxiCode

Bar Code v: FIM

Bar Code z: PDF-417

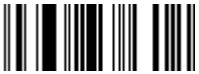
Bar Code W1c: DataMatrix

Bar Code W1d: QR Code

Bar Code W1f: Aztec

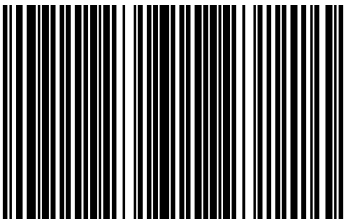
Bar Code W1I: EAN128 (w/auto subset switching)

Bar Code W1J: Code 128 (w/auto subset switching)



Bar Code W1k: RSS

Bar Code W1G: USD-8 (Code 11)



Bar Code W1R: UCC/EAN Code 128 K-MART NON EDI

Bar Code W1t: TLC39

Bar Code W1z: MicroPDF417

Appendix

Module Assignments

Memory Modules			
Designator	**Module Size**	**Volatile**[1]	**Location / Use**
C	–	Yes	Default, as assigned by <STX>X.
D	512 KB (default size)	Yes	Main Logic Card DRAM – 1 MB Configurable. User addressable for graphics, fonts, and label formats.
G[2]	512 KB	No	Main Logic Card Flash – User addressable for graphics, fonts, and label formats.
	See Note 3, below	No	Optional Expanded Flash Main Logic Card – User addressable for graphics, fonts, and label formats.
X	See Note 3, below	No	Optional Expanded Flash Main Logic Card – User addressable for graphics, fonts, and label formats. 256KB to 6.5MB size based on ILPC Font purchased.
Y	128 KB	No	Main Logic Card Flash – reserved for EFIGS

[1] When power is removed from the printer, stored data will be lost.

[2] The availability/size of the internal Flash Module is dependent upon the installed Main Logic Card; reference the Configuration Label, or following the <STX>KC command the "INTERNAL FLASH MODULE PRESENT" message. The Flash memory has a limited number of writes (approximately 100,000) and is intended for permanent (or semi-permanent) storage of downloaded images, fonts and label formats.

[3] Modules G and X are partitioned to equal the sum of the total space available - 6.5MB

Print Resolutions and Maximum Label Widths

Model	Printhead Resolution	Maximum Print Width		Factory Default Setting
		Inches	Millimeters	
A-4212	203 dots/inch (8 dots/mm)	4.10	104	4.10
A-4310	300 dots/inch (11.8 dots/mm)	4.16	105.7	4.16
A-4408	406 dots/inch (16 dots/mm)	4.10	104	4.10
A-4606	600 dots/inch (23.6 dots/mm)	4.16	105.6	4.16

Speed Ranges

	Speed Ranges and Defaults*			
	Range		Default Setting	
Model	IPS	MMPS	IPS	MMPS
A-4212: Print	2-12	51 – 305	8.0	203
Feed	2-12	51 – 305	10.0	254
Reverse	2-5	51 – 127	4.0	102
Slew	2-16	51 – 406	8.0	203
A-4310: Print	2-10	51 – 254	8.0	203
Feed	2-8	51 – 203	8.0	203
Reverse	2-5	51 – 127	4.0	102
Slew	2-16	51 – 406	8.0	203
A-4408: Print	2-8	51 – 203	8.0	203
Feed	2-12	51 – 305	8.0	203
Reverse	2-5	51 – 127	4.0	102
Slew	2-16	51 – 406	4.0	102
A-4606: Print	2-6	51 – 152	6.0	152
Feed	2-6	51 – 152	6.0	152
Reverse	2-5	51 – 127	4.0	102
Slew	2-16	51 – 406	8.0	203

*Consult the *Class Series Programmer's Manual* for detailed information.

Menu Constraint Cross-Reference

The table below highlights the menu item differences between the original PE model printers and the new A-Class models.

PE Menu Item	A-Class Menu Equivalent
Print Method	Media Type (see Section 4.2.2)
Select TOF	Sensor Type (see Section 4.2.2)
Darkness	Custom Adjustments – Darkness (see Section 4.2.3)
Start of Print	Custom Adjustments – Row Adjust (see Section 4.2.3)
Column Adjust	Custom Adjustments – Column Adjust (see Section 4.2.3)
PE Applicator Hardware	GPIO Device – Applicator (see Section 4.2.4) And GPIO Device – Start of Print (see Section 4.2.4)
Advanced Setup	N/A
PE Options – PE Output Signal	GPIO Device – End of Print (see Section 4.2.4)
PE Options – Backfeed Cntrl	Back After Print (see Section 4.2.5)
PE Options – Ribbon Low	GPIO Device – Ribbon Low (see Section 4.2.4)
PE Options – Exact Time Print	Imaging Mode (see Section 4.2.5)
PE Options – AUX Port GPIO	N/A. The Aux Port is now an RS-232 interface. See Communications – Serial Port B (see Section 4.2.6)
Ribbon Low Dia.	Ribbon Low Diameter (see Section 4.2.2)
Printer Model	Head Bias (see Section 4.2.5)
Counters	Media Counters (see Section 4.2.5)
Time/Date	Time and Date (see Section 4.2.5)

PE Menu Item	A-Class Menu Equivalent
Label Options – Heat Setting	Heat (see Section 4.2.3)
Label Options – Print Speed	Print Speed (see Section 4.2.3)
Label Options – Backfeed Speed	Reverse Speed (see Section 4.2.3)
Label Options – Label Width	Label Width (see Section 4.2.2)
Label Options – Label Length	Label Length (see Section 4.2.2)
Label Options – Peel Position	Present Distance (see Section 4.2.3)
Label Options – Rotate Label	Label Rotation (see Section 4.2.5)
System Options – Factory Settings	Set Factory Defaults (see Section 4.2.5)
System Options – Security Check	Security (see Section 4.2.5)
System Options – Modify Password	Modify Password (see Section 4.2.5)
System Options – Internal Module	Internal Module (see Section 4.2.5)
System Options – Scaleable Font	Scaleable Font Cache (see Section 4.2.5)
System Options – Symbol Set	Single Byte Symbols (see Section 4.2.5)
Compatibility – Offset Bias	SOP Emulation (see Section 4.2.5)
Compatibility – Positioning	DPL Emulation (see Section 4.2.5)

PE Menu Item	A-Class Menu Equivalent
Compatibility – Host CMDS–Ignore	See individual menu item in Section 4.2.6: ESC Sequences, Heat Command, Speed Commands, TOF Sensing Commands, Symbol Set Command, CNTRL-Codes Data
Compatibility – Prodigy Plus Mode	DPL Emulation (see Section 4.2.5)
Operation – Pause Mode	Pause Mode (see Section 4.2.5)
Operation – Feedback Mode	Feedback Characters (see Section 4.2.6)
Operation – Test Mode	N/A
Operation – Cutter	Cutter (see Section 4.2.4)
Operation – Ribbon Saver	Ribbon Saver (see Section 4.2.4)
Operation – Conversion	Units Of Measure (see Section 4.2.5)
Communications – COMM Setup PortA	Serial Port A (see Section 4.2.6)
Communications – Control Codes	Control Codes (see Section 4.2.6)
Maintenance – Test Print	N/A
Maintenance – Front Panel	N/A
Maintenance – Test I/O	Test GPIO (see Section 4.2.7) and Sensor Readings (see Section 4.2.7)
Maintenance – Serial Loopback	N/A
Maintenance – Installed Options	Printer Options (see Section 4.2.4)

PE Menu Item	A-Class Menu Equivalent
Modules – Print Directory	Print Directory (see Section 4.2.4)
Modules – Print File	Print File (see Section 4.2.4)
Modules – Copy Module	N/A
Modules – Format Module	Format Module (see Section 4.2.4)
Modules – Test Module	N/A
TOF Control OPTS	Sensor Calibration (see Section 4.2.2)

Appendix

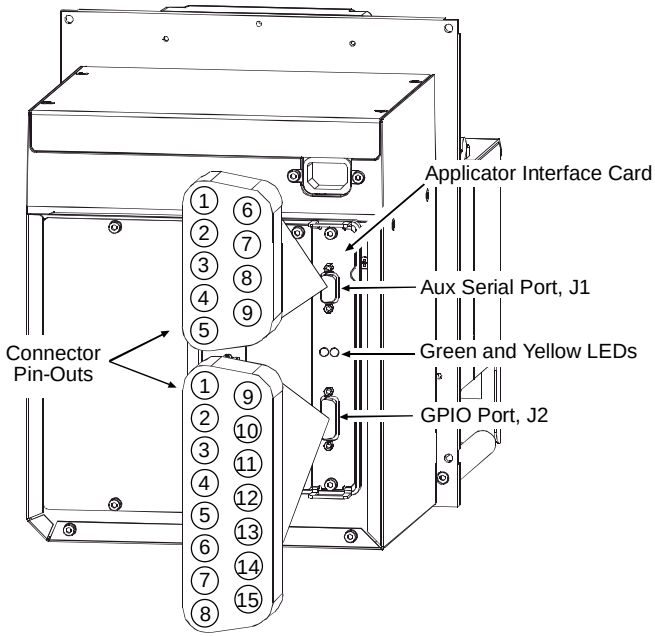
Applicator Interface Card Overview

The Applicator Interface Card, accessible from the back of the printer, contains all of the circuitry necessary to connect the printer to an applicator system.

Features of this card include the Aux Serial Port, GPIO Port, and two LEDs (see drawing below). Important hardware settings, functions, pin-outs, signal descriptions and timing diagrams are given in this section.

Operational settings can be configured via the Menu System. Settings are saved in non-volatile memory for subsequent power-ups.

Testing and diagnostic functions for the card are detailed in Section 4.2.7.



Aux Serial Port (J1)

The Auxiliary Serial Port is a 9-pin RS-232 interface (see Section 3.3.1 for pin-outs and connection details). Operational settings must be configured for the device being connected to the printer. Settings can be made using the `COMMUNICATIONS → SERIAL PORT B` menu selections (see Section 4.2.6).

GPIO Port (J2)

The GPIO Port is a 15-pin interface and requires a DB15 male connector (e.g., Startech C15PCM). The hardware and operational settings for this port must be configured for the device(s) being connected to the printer.

- Jumper settings select internally or externally powered interface circuitry; jumper settings also select +5 or +24 VDC signal output levels.
- Control signal logic states are programmable via the `PRINTER OPTIONS → GPIO` menu selections (see Section 4.2.4).

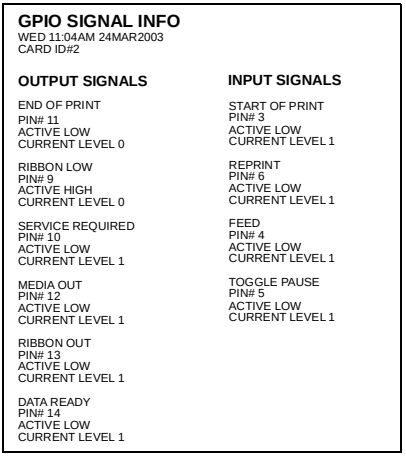
Green and Yellow LEDs

These indicators provide a visual check of printer/applicator activity:

- Yellow LED – Flash at power-up and when the card's outputs change state.
- Green LED – Flash at power-up and when the card's inputs change state.

GPIO Signal Info Label

A reference label can be printed using the `DIAGNOSTICS → TEST GPIO → PRINT SIGNAL INFO` menu selection (see Section 4.2.7).



GPIO SIGNAL INFO
WED 11:04AM 24MAR2003
CARD ID#2

OUTPUT SIGNALS

END OF PRINT
PIN# 11
ACTIVE LOW
CURRENT LEVEL 0

RIBBON LOW
PIN# 9
ACTIVE HIGH
CURRENT LEVEL 0

SERVICE REQUIRED
PIN# 10
ACTIVE LOW
CURRENT LEVEL 1

MEDIA OUT
PIN# 12
ACTIVE LOW
CURRENT LEVEL 1

RIBBON OUT
PIN# 13
ACTIVE LOW
CURRENT LEVEL 1

DATA READY
PIN# 14
ACTIVE LOW
CURRENT LEVEL 1

INPUT SIGNALS

START OF PRINT
PIN# 3
ACTIVE LOW
CURRENT LEVEL 1

REPRINT
PIN# 6
ACTIVE LOW
CURRENT LEVEL 1

FEED
PIN# 4
ACTIVE LOW
CURRENT LEVEL 1

TOGGLE PAUSE
PIN# 5
ACTIVE LOW
CURRENT LEVEL 1

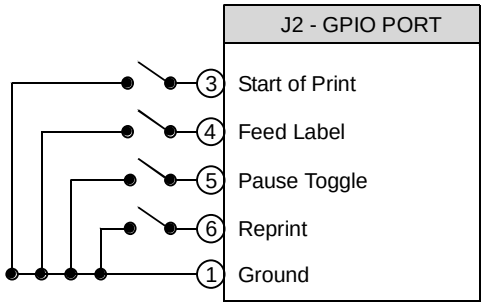
Applicator Interface Configuration

Follow the steps below to setup the Applicator Interface Card:

1. To configure the Applicator Interface Card, begin by deciding how your applicator needs to be interfaced to the printer. Two different circuit suggestions are as follows:

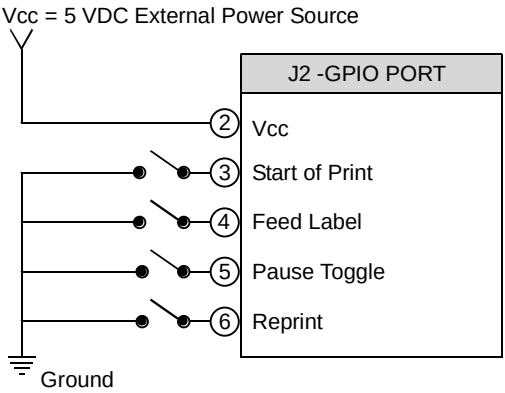
- ***Direct applicator interface circuitry –***

  The example, shown right, uses the printer's +5 VDC and Ground to supply the applicator control devices.



- ***Isolated applicator interface circuitry –***

  The example, shown right, uses an external +5 VDC and an external Ground to supply the applicator control devices. (JMP7 and JMP8 must be removed from the Applicator Interface Card, see Step 6. below)



2. Determine the signal voltage required by the applicator for control signals such as End of Print, Data Ready Service Required. The table below details the pin-outs, functions, and configurable hardware and operational settings of the Applicator Interface Card; all signal directions are given relative to the printer.

WARNING ***Failure to properly configure the jumper settings of the GPIO Port may result in damage to the printer and / or the applicator.***

GPIO Port (J2) Pin Functions and Associated Jumper Selections					
Pin #	**Signal Name**	**Signal Direction**	**Active Setting**	**Jumper Placement**	**Function / Description**
1	Ground (Configurable)	Ground	Ground	JMP 8 'On'	Printer chassis ground is used
		Open	Open	JMP 8 'Off'	Ground return must be supplied
2	+5 VDC (Configurable)	Output	+5 VDC	JMP 7 'On'	Printer +5 VDC is used (.5 amp max.)
		Open	Open	JMP 7 'Off'	+5 VDC must be supplied
3	Start Of Print [5]	Input	Programmable [1]	N/A	N/A
4	Feed Label [4]	Input	Low		
5	Pause Toggle	Input	Low		
6	Reprint [3]	Input	Low		
7	+24 VDC (1.0 amp max.)	Output	+24 VDC		
8	Ground	Ground	Ground		
9	Ribbon Low	Output	Programmable [1]	JMP 9: Pins 1 & 2 = +5 VDC *– OR –* Pins 2 & 3 = +24 VDC	**See WARNING message, above.** When inactive, all output pins will be pulled up to the voltage determined by this jumper setting.
10	Service Required [2]	Output	Low		
11	End Of Print	Output	Programmable [1]		
12	Media Out	Output	Low		
13	Ribbon Out	Output	Low		
14	Data Ready (DRDY)	Output	Low		
15	Spare	Output	N/A	N/A	N/A

[1] For details see Section 4.2.4.

[2] Evoked by occurrences listed under 'Fault Messages' in Section 6.2.

[3] Reprints the last label exactly, with no increment or time stamp changes; use it for error conditions. Always keeping this signal LOW will result in non-stop printing.

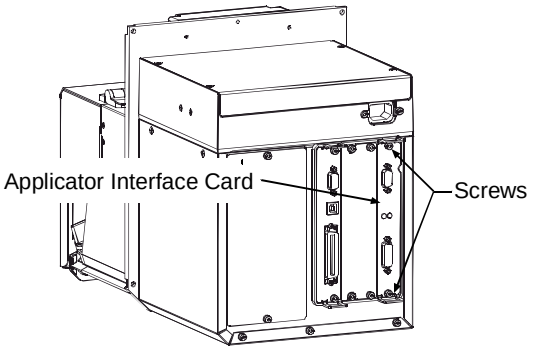
[4] Advances media until the signal goes HIGH and, if not in continuous mode, the media will be positioned at the next available media TOF.

[5] If active with no current print job, "WAITING FOR DATA" is displayed. Specifying a quantity of 9999 while always keeping this signal 'ON' will cause non-stop label printing, except in single label mode (see Imaging Mode, Section 4.2.5), which will cause the printer to stop between labels; see Timing Diagrams, below.

3. Make sure that the printer is turned 'Off' and that the AC Power Cord is unplugged. Also, remove any interface cable(s) attached to the Applicator Interface Card.

> ☑ ***Note:*** *Depending upon the configuration of your printer, the location of the Applicator Interface Card can vary.*

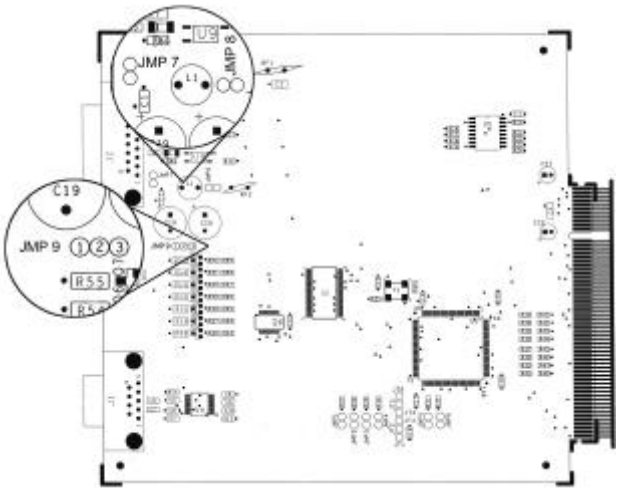
4. Remove the two Screws that secure the Applicator Interface Card to the printer.



> **CAUTION** *Always wear a wrist strap and follow standard ESD prevention measures when handling the Applicator Interface Card.*

5. Pull out the Applicator Interface Card and place it on a static-free work area.

6. Using the table above and the illustration below, configure the jumpers to meet your system's requirements.



7. Slide the card back into the printer; secure it in place with the two screws.

8. Connect an applicator interface cable to J2 (and, if needed, connect a serial cable to J1).

9. Reconnect the power cord and turn ‘On’ the printer.

10. Using the Menu System, configure the operation settings of the GPIO Port to meet the requirements of your applicator system (see Section 4.2.4).

    If needed, also configure the operation settings of the Aux Serial (Serial Port B) to meet the requirements of your system (see Section 4.2.6).

11. If desired, confirm your programmed settings by printing a GPIO Signal Info label (see Section 4.2.7). This completes the setup of the Applicator Interface Card.

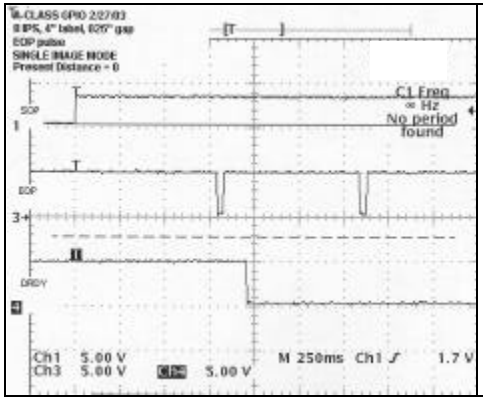
Applicator Timing Signals

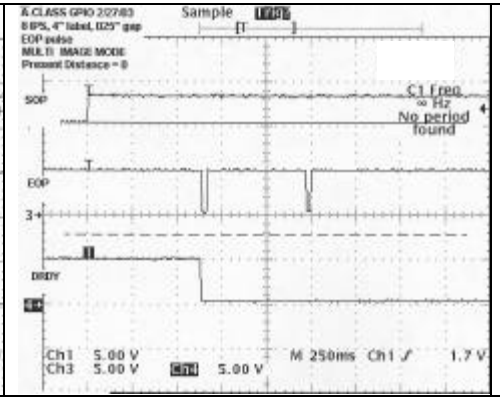
During a typical print cycle, DRDY (Data Ready) will become active when a label is waiting to be printed. After the SOP (Start Of Print) signal is received by the printer, printing will begin. For synchronization with the print cycle, the EOP (End Of Print) signal indicates the completion of the print process. Screen shots of timing signals for the GPIO Interface are presented below. All sample shots were taken while printing a two-count label batch. The variable parameters were as follows:

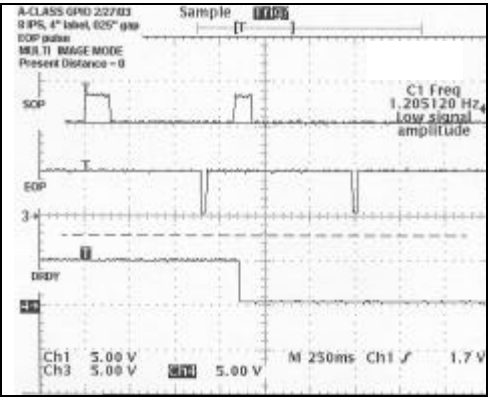
- Present Distance = 0 or .25"
- Start of Print = ‘On/Off’ (pulsed) or ‘On’
- Imaging Mode = Single (stops) or Multi (keeps going)

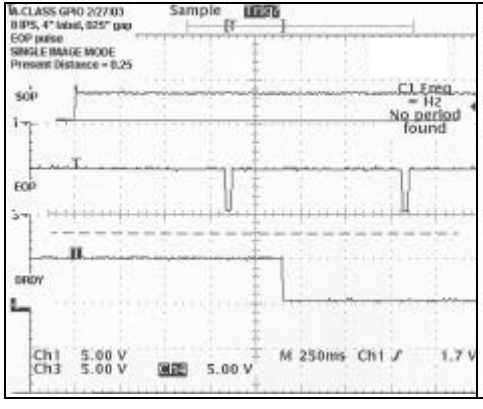
All other parameter notes accompany the particular screen shot.

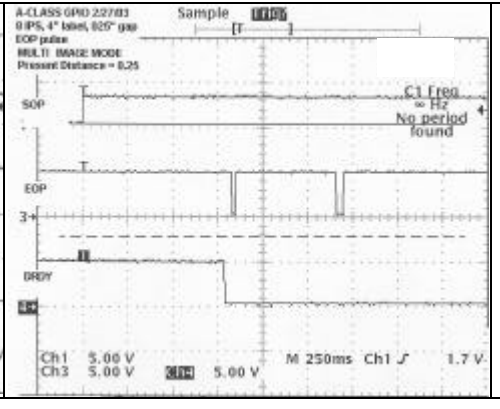
☑ ***Note:*** *The printing process is not complete until the label reaches its present distance (if programmed) because a label that is presented requires addition positioning (back-up) and, therefore, more time.*

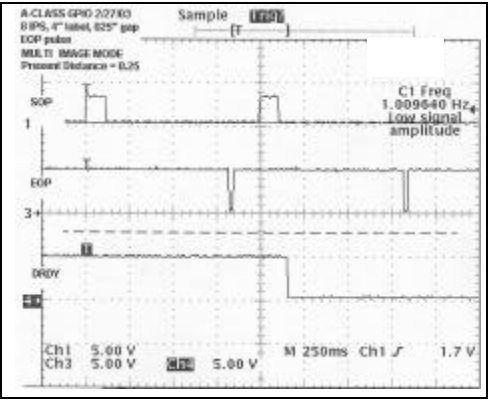

A-CLASS GP10 2/27/03
8 IPS, 4" label, .025" gap
EOP pulse
SINGLE IMAGE MODE
Present Distance = 0
C1 Freq
∞ Hz
No period found
SOP
EOP
DRDY
Ch1 5.00 V
Ch3 5.00 V
5.00 V
M 250ms Ch1 ƒ 1.7 V

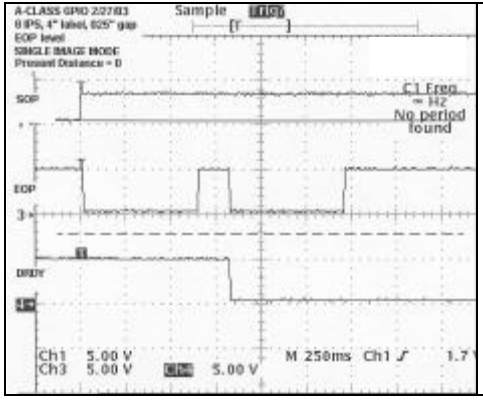

A-CLASS GP10 2/27/03
Sample
8 IPS, 4" label, .025" gap
EOP pulse
MULTI IMAGE MODE
Present Distance = 0
C1 Freq
∞ Hz
No period found
SOP
EOP
DRDY
Ch1 5.00 V
Ch3 5.00 V
5.00 V
M 250ms Ch1 ƒ 1.7 V

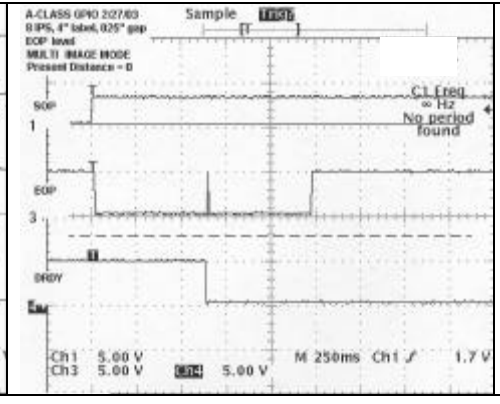

A-CLASS GP10 2/27/03
Sample
8 IPS, 4" label, .025" gap
EOP pulse
MULTI IMAGE MODE
Present Distance = 0
C1 Freq
1.205120 Hz
Low signal amplitude
SOP
EOP
DRDY
Ch1 5.00 V
Ch3 5.00 V
5.00 V
M 250ms Ch1 ƒ 1.7 V

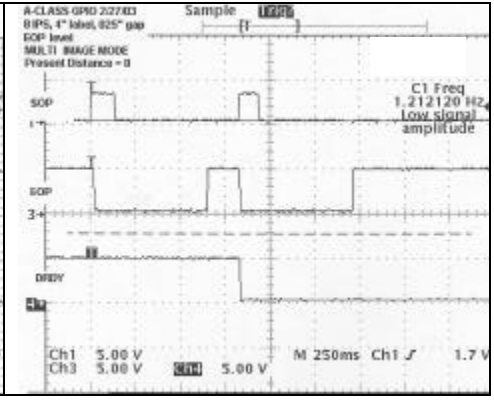

A-CLASS GP10 2/27/03
Sample
8 IPS, 4" label, .025" gap
EOP pulse
SINGLE IMAGE MODE
Present Distance = 0.25
C1 Freq
∞ Hz
No period found
SOP
EOP
DRDY
Ch1 5.00 V
Ch3 5.00 V
5.00 V
M 250ms Ch1 ƒ 1.7 V

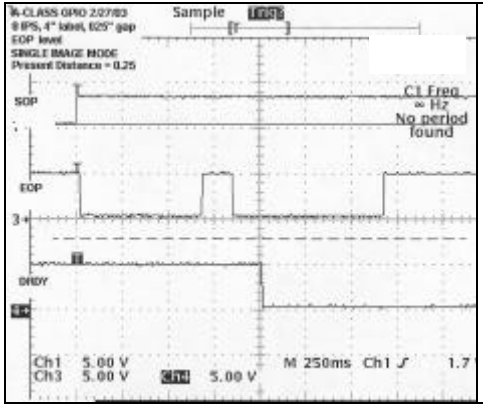

A-CLASS GP10 2/27/03
Sample
8 IPS, 4" label, .025" gap
EOP pulse
MULTI IMAGE MODE
Present Distance = 0.25
C1 Freq
∞ Hz
No period found
SOP
EOP
DRDY
Ch1 5.00 V
Ch3 5.00 V
5.00 V
M 250ms Ch1 ƒ 1.7 V

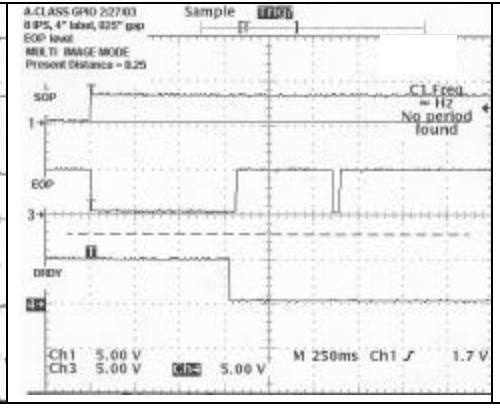

A-CLASS GP10 2/27/03
Sample
8 IPS, 4" label, .025" gap
EOP pulse
MULTI IMAGE MODE
Present Distance = 0.25
C1 Freq
1.009640 Hz
Low signal amplitude
SOP
EOP
DRDY
Ch1 5.00 V
Ch3 5.00 V
5.00 V
M 250ms Ch1 ƒ 1.7 V

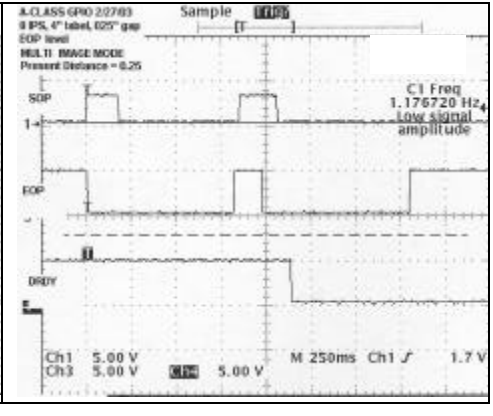

A-CLASS GP10 2/27/03
8 IPS, 4" label, .025" gap
EOP level
SINGLE IMAGE MODE
Present Distance = 0
Sample
C1 Freq
∞ Hz
No period found
SOP
EOP
DRDY
Ch1 5.00 V
Ch3 5.00 V
Ch4 5.00 V
M 250ms Ch1 ƒ 1.7 V


A-CLASS GP10 2/27/03
8 IPS, 4" label, .025" gap
EOP level
MULTI IMAGE MODE
Present Distance = 0
Sample
C1 Freq
∞ Hz
No period found
SOP
EOP
DRDY
Ch1 5.00 V
Ch3 5.00 V
Ch4 5.00 V
M 250ms Ch1 ƒ 1.7 V


A-CLASS GP10 2/27/03
8 IPS, 4" label, .025" gap
EOP level
MULTI IMAGE MODE
Present Distance = 0
Sample
C1 Freq
1.212120 Hz
Low signal amplitude
SOP
EOP
DRDY
Ch1 5.00 V
Ch3 5.00 V
Ch4 5.00 V
M 250ms Ch1 ƒ 1.7 V


A-CLASS GP10 2/27/03
8 IPS, 4" label, .025" gap
EOP level
SINGLE IMAGE MODE
Present Distance = 0.25
Sample
C1 Freq
∞ Hz
No period found
SOP
EOP
DRDY
Ch1 5.00 V
Ch3 5.00 V
Ch4 5.00 V
M 250ms Ch1 ƒ 1.7


A-CLASS GP10 2/27/03
8 IPS, 4" label, .025" gap
EOP level
MULTI IMAGE MODE
Present Distance = 0.25
Sample
C1 Freq
∞ Hz
No period found
SOP
EOP
DRDY
Ch1 5.00 V
Ch3 5.00 V
Ch4 5.00 V
M 250ms Ch1 ƒ 1.7 V


A-CLASS GP10 2/27/03
8 IPS, 4" label, .025" gap
EOP level
MULTI IMAGE MODE
Present Distance = 0.25
Sample
C1 Freq
1.176720 Hz
Low signal amplitude
SOP
EOP
DRDY
Ch1 5.00 V
Ch3 5.00 V
Ch4 5.00 V
M 250ms Ch1 ƒ 1.7 V

Appendix

Multi-Language Menu System

This printer provides the user with the ability to download new menu system languages and/or replace the Datamax provided translations. A Microsoft® Excel Spreadsheet defines the menu dictionary – the user adds a new language column or modifies an existing column in the spreadsheet, clicks on the 'Generate DPL file(s)' radio button and sends the generated DPL file(s) 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 128KB 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.

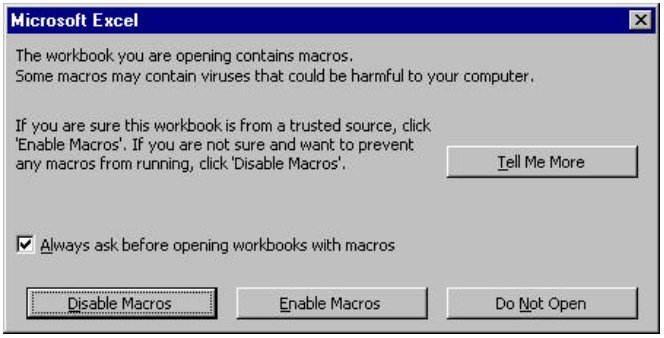
Required Software	Comment
A-Class Application Version 3.0 or greater[1]	Must reside in the target printer. (See Section 5.5 for details.)
Microsoft® Excel 97	Must be purchased by user.
`Img2dl.exe`[1] [2]	Program used during the process to create DPL file.
`Common.xls`[1] [2]	Menu Dictionary

[1] Datamax provides these software files and programs. They are available at `ftp://ftp.datamaxcorp.com/Anonymous/Firmware/EFIGS/`

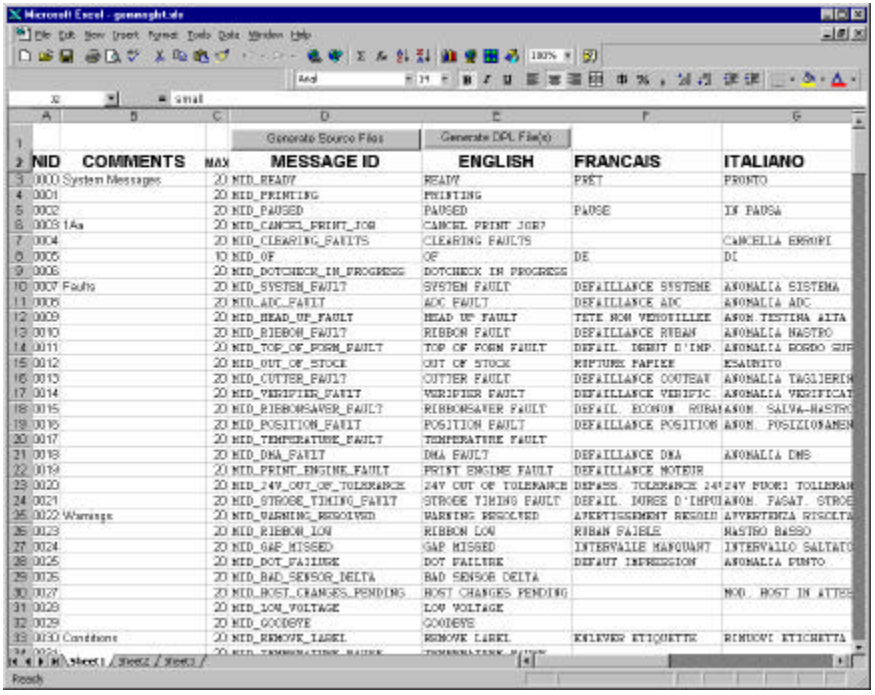
[2] Datamax recommends that the `Img2dl.exe` and `Common.xls` files reside in the same directory.

Creating a Menu Language:

1. Invoke Excel and open the common.xls file. Excel opens the file and the following screen appears.



2. Click the “Enable Macro” box and the following appears:



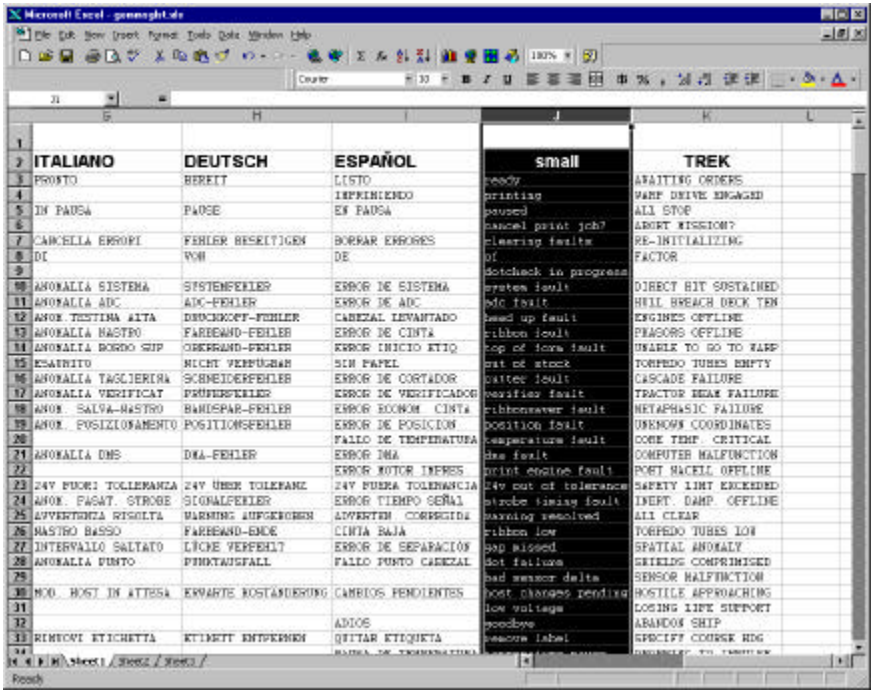
3. Click On Column J and enter your new language, or modify an existing one.

   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.



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

4. 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.

5. 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)

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

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

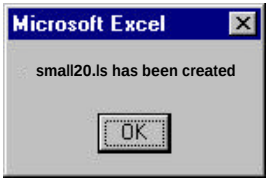
7. Reset the printer by pressing and holding the CANCEL Key for approximately four seconds.

8. Verify the operation by printing a Configuration Label (see Section 4.4.2). 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 system displays the new language selection, but all displayed messages remain in English an error has occurred. Re-check the process. Contact Datamax Technical Support if problems continue (be prepared to provide the `common.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.

9. Use Steps 1 – 8 with the filename `misc.xls` to translate printer option items. This will output `small20.ls`.



Advanced File Handling Information

- The Standard Datamax Printer leaves the factory with EFIGS loaded into module Y. At this point, 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

Saving a Configuration File

Using the Configuration File feature, the printer can save and restore complete printer settings, including media calibration parameters. Here are the feature's highlights and restrictions:

- Configuration files eliminate the need to repeat the manual steps of a special printer setup, making future changeovers faster and easier.
- Configuration files can be setup, saved, and restored either from the host or via the User Interface as 'C-type' files on Module Y under unique filenames that can be up to nineteen characters in length.
- Configuration files enable the host, via special DPL commands, to control parameters previously accessible only from the User Interface (consult *Class Series Programmer's Manual* for details).
- Regular host settings cannot be saved using the User Interface menu.

☑ ***Note:*** *Configuration files will typically correspond to a particular printer and media application. If a file will be shared among printers, do NOT include unique parameters (such as calibrations and adjustments) because those settings will vary from one unit to another.*

When using the User Interface to save a configuration file (see Section 4.2.5), the keypad functions within the 'Save Setting As' submenu are as follows:

	The DOWN ARROW Key scrolls down through the alphanumeric, underscore, and delete character.
	The UP ARROW Key scrolls up through the alphanumeric and underscore characters, and the delete function.
	The ENTER Key accepts the displayed character and advances the cursor.
	Saves the displayed file.

To save a manually entered setup (for example, an application that required an Advanced Entry Calibration before beginning) as a configuration file using the User Interface, proceed as follows:

Step	Display Message	Action	Comment(s)
1	READY	Press the MENU Key.	You are entering 'Menu Mode'.
2	MEDIA SETTING	Use the ↑ Key to scroll to 'System Settings'.	The ↓ Key can also be used.
3	SYSTEM SETTINGS	Press the ENTER Key to select 'System Settings'.	You are entering the 'System Settings' menu.
4	SYSTEM SETTINGS	Use the ↑ Key to scroll to 'Configuration File'.	The ↓ Key can also be used.
5	CONFIGURATION FILE	Press the ENTER Key to select 'Configuration File'.	You are entering the 'Configuration File' submenu.
6	RESTORE AS CURRENT	Press the ↑ Key to scroll to 'Save Setting As'.	The ↓ Key can also be used.
7	SAVE SETTING AS	Press the ENTER Key.	Press the ESC Key to exit this selection.
8	:	Enter a file name using the ↓ Key to scroll through the characters.	The ↑ Key can also be used.
		☑ ***Note:*** *To change an accepted character, select the delete function (solid flashing block) and press the ENTER Key.*	

Step	Display Message	Action	Comment(s)
9	SPECIAL :	Use the ENTER 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 setting” function, delete all entered characters in the file name and press the ESCAPE Key.*	
10	SUCCESSFUL	Press the ESC Key repeatedly to save the file name and return to ‘Ready’.	Save complete. (To restore a saved file using the User Interface; see Section 4.2.5.)

Appendix

Ribbon Saver

Overview

The Ribbon Saver Option operates automatically. When more than .25 inches (6.4 mm) of ribbon can be saved in areas of label white space, the printhead lifts and a brake stops ribbon motion, while a pinch roller advances the media. At about .25 inches before the next line of print the brake releases and the printhead is lowered to resume printing. There are some parameters to keep in mind regarding this operation; to use this option effectively you'll need to understand them:

- ***Speed-dependant white space minimums:*** Printing speed will determine the amount white space is passed before the ribbon saver engages. For example, at 2 IPS there must be at least .65 inches (16.5 mm) of white space, while at 8 IPS the area increases to 1.2 inches (30.5 mm). The amount of ribbon passed before the ribbon saver engages is also speed dependent, while ribbon savings become significant, as the white space gets larger.

  ☑ ***Note:*** *If a Top of Form, Out of Stock, Position, Ribbon or Head Lift Fault occurs, ribbon saving will not occur during the first two inches (51 mm) after printing is restarted.*

- ***Multiple lifts per label:*** The ribbon saving feature will actuate a maximum of twenty times per label.

- ***Software control:*** Software commands can enable or disable the ribbon saving function. For details, refer to your labeling software documentation; or, if writing your own program in DPL, refer to the *Class Series Programmer's Manual*.

- ***User Interface control:*** A menu selection can enable or disable the ribbon saving function, see Section 4.2.4. However, menu selections may be overridden by the software program or DPL commands.

- ***Testing:*** A menu selection is available to test the ribbon saving feature, see Section 4.2.7.

- ***Continuous printing:*** Label throughput will not be affected when using the Ribbon Saver. Printing speeds and ribbon saving are maintained through the entire range for that printer model. At faster speeds, however, a light horizontal mark at the point just before the Ribbon Saver has disengaged may appear across the label. This mark is produced as the already moving label contacts the stationary ribbon. There are two ways to minimize this contact mark: (1) change to a slightly harder wax or wax/resin formulation of ribbon; or, (2) slow down the print speed.

Warranty Information

Datamax Barcode Products
Limited Warranty Statement

A-Class™ Printers

Printer

Datamax warrants* to Purchaser that under normal use and service, the A-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 one year, (365 days), or one million (1,000,000) 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, Rollers, 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 A-Class™ thermal printhead, rollers, 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 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.

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 Programmer's Manual*

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

fan-fold Media that is folded and stacked.

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

GPIO (General Purpose Input Output) A specialized interface port for use with external printer control devices including applicators, verifiers, RFID systems, etc.

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

label A paper or synthetic printing material, typically with a pressure sensitive 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 An electronic device equipped with photosensors to detect media and the top-of-form on 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.

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 cardboard core.

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

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.