M-Class™ *Mark II*

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Important Safety Instructions

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

- Carefully read the provided installation and operating instructions.
- Read and follow all warning instruction labels on the printer.
- Place the printer on a flat, firm, solid surface.
- Make sure all openings on the printer remain unblocked; never insert anything into the openings or ventilation slots.
- Do not place the printer near a heat source.
- Do not use your printer near water, or spill liquid into it.
- Be certain that your power source matches a listed voltage rating for the printer (if unsure, check with your dealer or local utility company).
- Do not place the power cord where it can be stepped on; and, if the power cord becomes damaged, immediately replace it.
- If service is required, use only qualified trained technicians to repair your printer.

Agency Compliance and Approvals

UL60950-1; 2003 2nd Edition
CSA C22.2 No. 60950-1-07 2nd Edition; 2005-12

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

EMC: 2004/108/EC
      EN 55022 (2006,A1:2007) Class B
      EN 50024 (1998, A1:2001, A2:2003)

Safety: This product complies with the requirements of EN 60950-1, 2nd Edition 2005-12
ROHS: 2002/95/EC
LVD: 2006/95/EC

Customs Union – Russia, Kazakhstan, Belarus

GB4943.1-2011, GB9254-2008, GB17625.1-2003

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

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

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1 Getting Started

1.1 Introduction

Congratulations on your M-Class Mark II printer purchase. The M-Class Mark II printer family, hereafter referred to as 'the printer', blends the rugged durability of die-cast construction with state-of-the-art electronics and user-friendly features to redefine the standard in industrial thermal printers.

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

To print labels or tags, simply refer to the instructions included with the software you have chosen to create the labels. A Windows™ printer driver can be found on our website (http://www.datamax-oneil.com/) or on the included CD-ROM for printing from common applications. If you wish to write a custom program, a copy of the Class Series 2 Programmer's Manual can also be found on the CD-ROM.

1.2 Unpacking

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

- Printer
- Power Cord
- CD-ROM and Documentation
- Any special or additionally purchased items

Additional Requirements

The following items are necessary for generating labels from your printer. Contact your customer support or sales representative for advice on which media and software may best be suited for your application.

- Serial, USB or Parallel cable
- Ethernet cable for optional LAN connectivity
- Applicable Media

ⓘ   It is a good idea to save all packaging materials for future use.

2 Printer Setup

2.1 Printer Connections

Power Connection

☑ Before connecting the AC Power Cord or interface cables to the printer, ensure the Power On/Off Switch is in the 'Off' position.

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

2. Ensure that the Power Switch on the Printer is in the 'Off' position.

3. Connect the AC Power Cord to the receptacle on the back of the Printer, and then plug the AC Power Cord into a properly grounded outlet. (The power supply automatically detects and then adjusts to the applied line voltage; see Appendix A for the acceptable voltage ranges.)
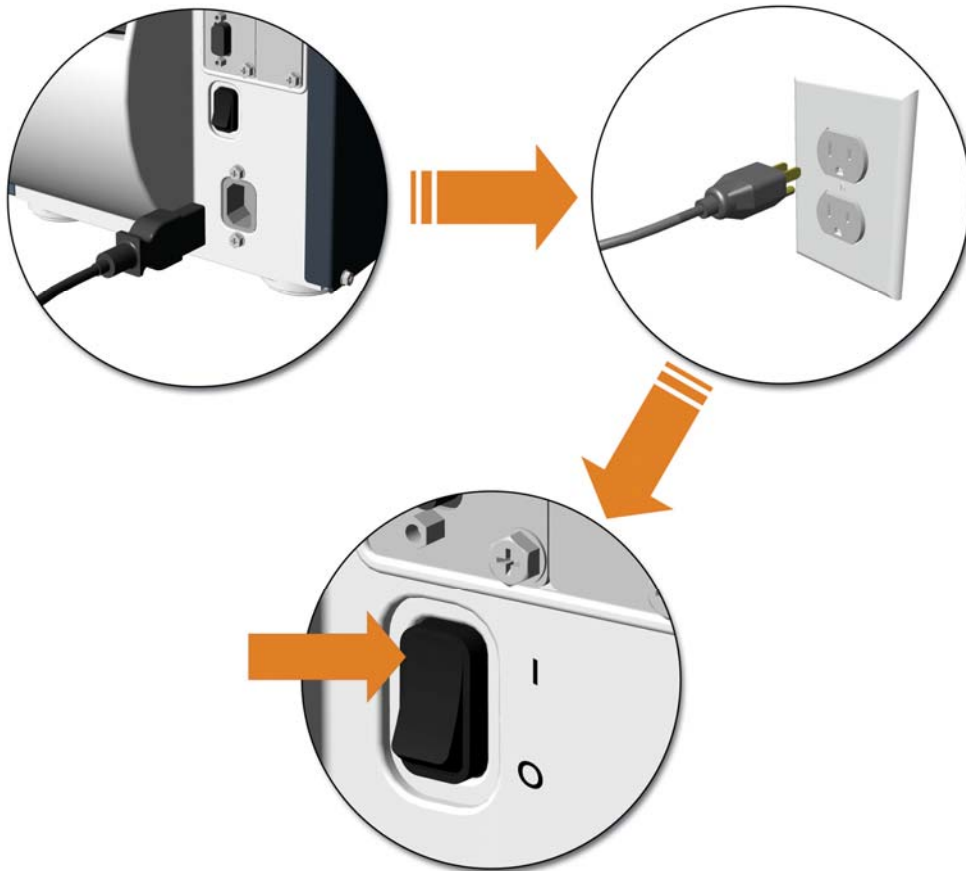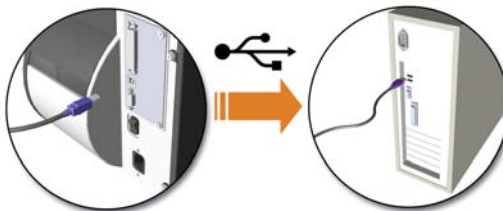
Interface Connection

The printer can be connected to the host via the parallel, USB, serial, or optional network interface. The printer will automatically connect to the first port that delivers valid data. Once established, the printer's power must be cycled 'Off' and 'On' to change an interface connection.

A couple of **Optional Ethernet Print Servers (wired and wireless)** are available. For information on using these interfaces, refer to the instructions included with the option for proper cabling, setup, and configuration.
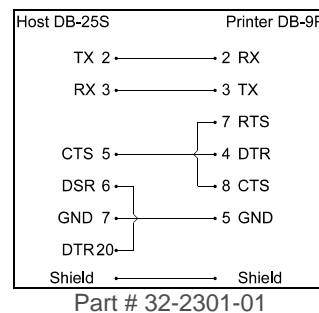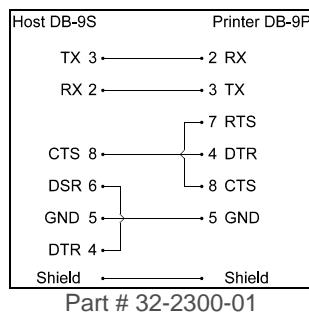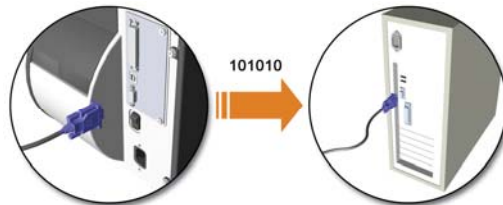
The **Parallel Connection** needs a Centronics IEEE 1284 cable with a 36-pin male connector for unidirectional (forward channel) communications, or an IEEE 1284 Compliant cable for bi-directional communications (forward and reverse channels). Also, for bi-directional communications your host must have supporting software.
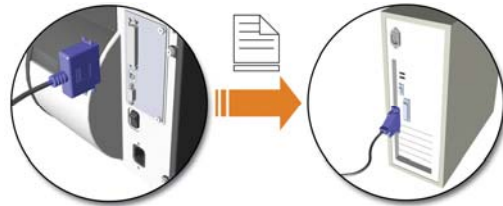
The **USB Connection** needs a USB cable and is supported in Windows 95 and greater operating systems. Depending upon the operating system of your host computer, installation requirements may differ slightly.

The **Serial Connection** needs a serial interface cable with specific pin-outs for proper communications (part numbers and pin-outs are given, below; contact your reseller to order). The interface supports RS-232C communications via a DB-9 connector. Serial port settings are menu-selectable and must match your host's serial port settings.

Host DB-9S		Printer DB-9P
TX 3	⟶	2 RX
RX 2	⟶	3 TX
		7 RTS
CTS 8		4 DTR
DSR 6		8 CTS
GND 5	⟶	5 GND
DTR 4		
Shield	⟷	Shield

Part # 32-2300-01

Host DB-25S		Printer DB-9P
TX 2	⟶	2 RX
RX 3	⟶	3 TX
		7 RTS
CTS 5		4 DTR
DSR 6		8 CTS
GND 7	⟶	5 GND
DTR 20		
Shield	⟷	Shield

Part # 32-2301-01

SDIO and USB Host Port Connections

If equipped with the Secure Digital Input Output (SDIO) and USB Host Ports, the printer can accept external storage devices for fonts, graphics, label formats, and firmware files. The USB Host Port also accepts a USB keyboard for standalone, direct data (Line mode) input applications; see the *Class Series 2 Programmer's Manual* for examples.

SDIO Connections - When installing an SDIO Card, turn OFF the printer then slide the card into the slot. Module "F" will be recognized by the printer. When removing a card, turn OFF the printer then press inward on the card to release it.

USB Host Port Connections - The USB Host Ports support plug and play device installation and removal. Module "H" and Module "I" will be recognized by the printer.

- *Memory device sizes up to 16 GB are supported.*
- *If equipped on the memory device, ensure that the Write Protect Switch is OFF.*
- *Before initial use, format the external memory device; see Section 4.5, Printer Options, Modules for details.*
- *Always allow process completion before removing modules.*

Using Memory Functions *(Display-equipped printers)*

Download your files to the device using Windows Explorer or DMX Config; see FILE HANDLING DEFINITIONS in Appendix A. The following examples highlight several ways to use memory devices; unless otherwise noted (see Section 4.5, Printer Options, Modules for details about function selections).

- *Files that reside in Module "X" cannot be copied; see the* Class Series 2 Programmer's Manual *for module details.*
- *For access to all functions, ensure that the Advanced Menu is selected: Press* **System Settings** *select* **Menu Mode** *and then* **Advanced Menu***.*

➤ To copy files stored on a module to or from the printer:

1. Press the **MENU** button then select **Printer Options**.

2. Select **Modules** and then **Copy File**.

3. Select the file to copy and then the destination module ID.

When sharing configuration files between printers, use Restore As Current (see Section 4.5, System Settings, Configuration File) and then calibrate the printer.

➤ To copy firmware stored on a module to the printer:

1. Press the **TEST** button then select **User Defined Label**.

2. Select the module ID and the firmware file.

➤ To print files stored on a module:

1. Press the **TEST** button and then select **User Defined Label**.

2. Select the module ID then the file to print.

☑ *To print directly from stored files at power-up; see Section 4.5, System Settings, User Label Mode.*

➤ To print a previous label format that is stored in memory:

    1.   Press the **MENU** button then select **Printer Options**.

   2.   Select **Modules** and then **Print File**.

2.2 Loading Media

Load media into the printer as follows:

1.   Open the media cover and lower the Media Hanger Guide (if equipped) and Media Guide.

2.   Press in on the Printhead Latch and raise the Printhead Assembly.

❶	Printhead Latch
❷	Media Guide
❸	Media Hanger Guide
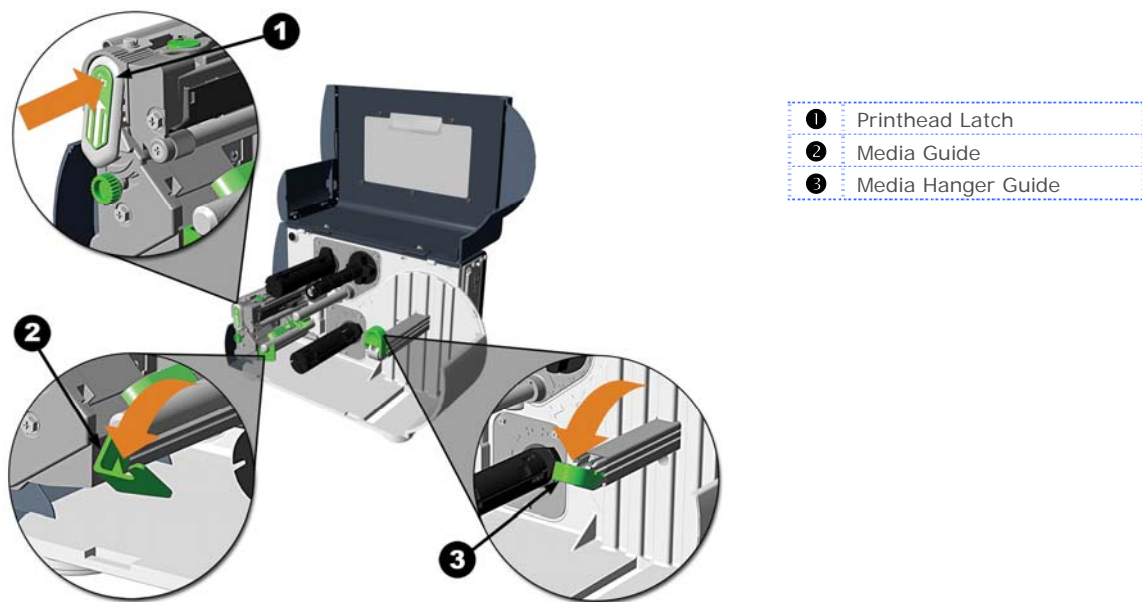
3.   Slide the Roll Media onto the Media Hub or Media Hanger. If the printer is equipped with a Media Hanger, raise the Media Hanger Guide. The Media Hanger Guide should be pushed inward so that it is just touching the Roll Media.

4.   Route the Media through the printer as shown. Raise the Media Guide. The Media Guide should be pushed inward so that it is just touching the edge of the Media.
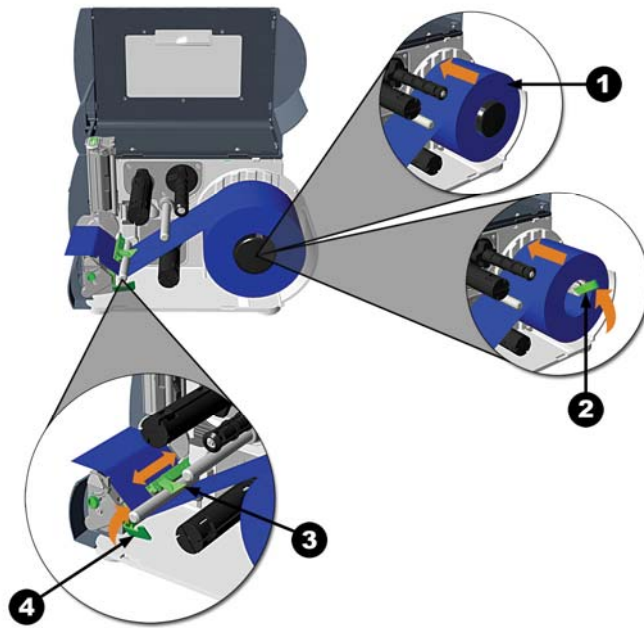
❶	Roll Media
❷	Media Hanger Guide
❸	Media Sensor
❹	Media Guide

5. Close the Printhead Assembly and press down until it locks into place.

6. Close the cover and press the ✛ FEED button several times to position the media and ensure proper tracking.
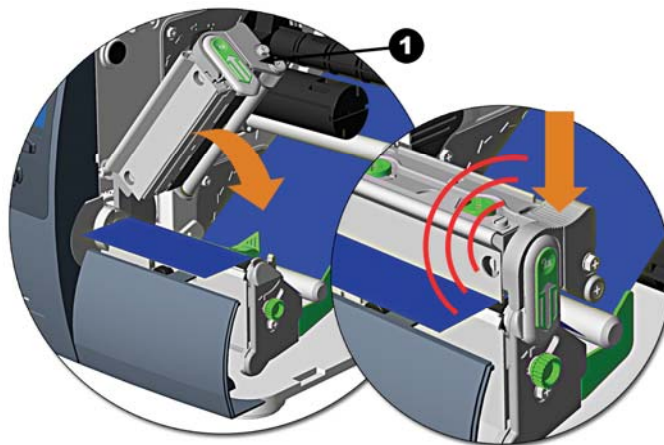
❶	Printhead Assembly

If the printer does not correctly sense the top of each label, it may be necessary to calibrate the printer (see Section 3.5 Media Calibration).

☑ The printer is factory set to use 4-inch media (and ribbon, if thermal transfer equipped). When using a different width of media/ribbon, refer to Section 5.3.

☑ On M-4210 models equipped with a Media Hanger in place of a Media Hub, high print speeds may result in printing degradation. It is recommended to set the print speed at 8ips or less.

2.3 Media Sensor Adjustment

The Media Sensor needs to be positioned so that the printer can detect the presence of media and the top-of-form (except for continuous stock, where the TOF is set through the front panel.

To adjust:

1. With media loaded, as described in Section 2.2, grasp the Slide Tab and move the Sensor Eye Mark into position over media according to the table below.

2. If loading media, return to the media loading instructions.

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
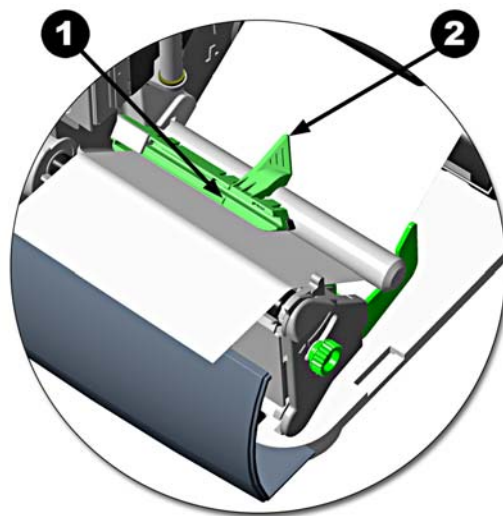
| ❶	'Sensor Eye' Mark
❷	Slide Tab

2.4 Loading Ribbon

Ribbon is required with thermal transfer media. It is recommended that the width of the ribbon be slightly wider than the media being used. The printer can use either ribbons with the 'coating side in' <u>or</u> ribbons with the 'coating side out'. To load:

☑
- Using a ribbon that is slightly wider than your media (and liner, if any) will help protect against printhead wear.

- The 'Media Type' setting within the printer's setup must be set to 'Thermal Transfer' to print using ribbon. This can be accomplished via the DMXConfig Utility (see section 3.4); or, if display-equipped, via the menu system (see section 4.5).

1. Open the media cover. Press in on the Printhead Latch and raise the printhead assembly.
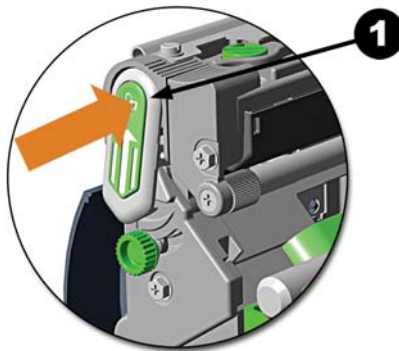
❶	Printhead Latch

2. Slide the Ribbon Roll onto the Ribbon Supply Hub until it rests against the flange. Ensure the ribbon unwinds in the correct direction (see Ribbon Routing). The illustrations below depict a 'Coated Side In' ribbon.
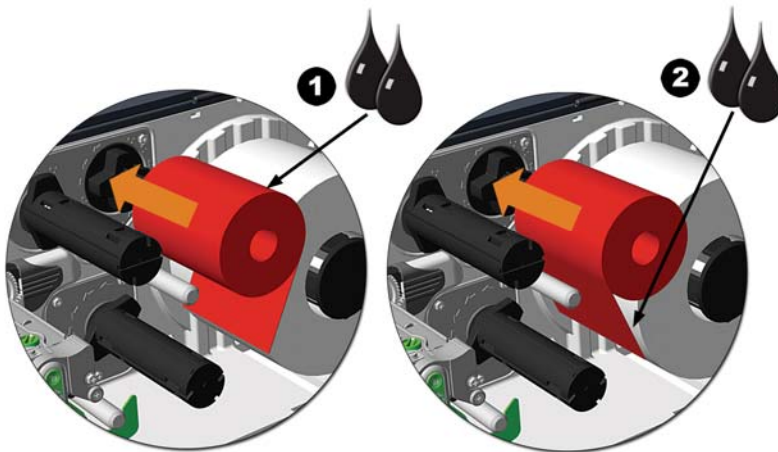
❶	Ink Side (CSO Ribbon)
❷	Ink Side (CSI Ribbon)

☑ Directional Arrows near the Ribbon Supply Hub indicate the correct ribbon route. Ribbon types are available with the ink (coating) layer wound 'in' or 'out'. Ensure the inked side of the ribbon faces the media and <u>NOT</u> the printhead.

Ribbon Routing Diagrams
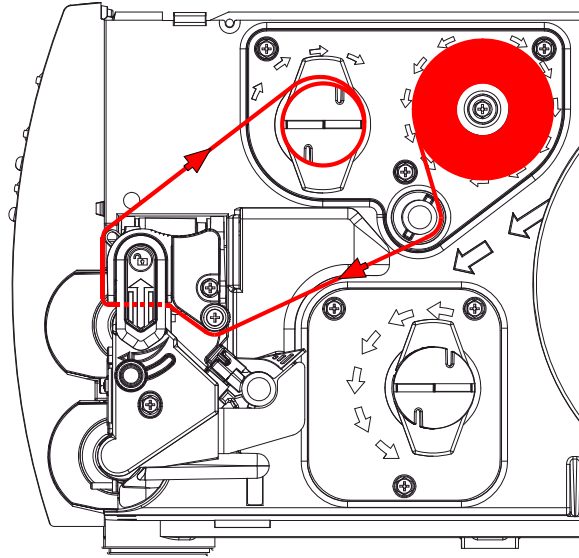
(CSI) 'Coating Side In' Ribbon Routing
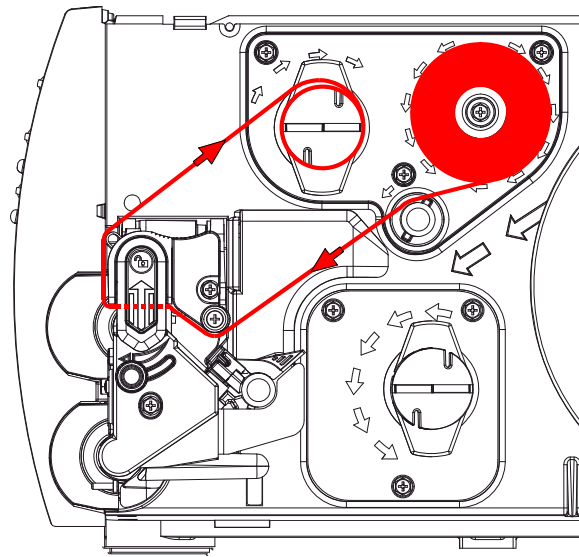
(CSO) 'Coating Side Out' Ribbon Routing

3. Route the ribbon under the Ribbon Idler and then out the front of the printer approximately 12 inches.
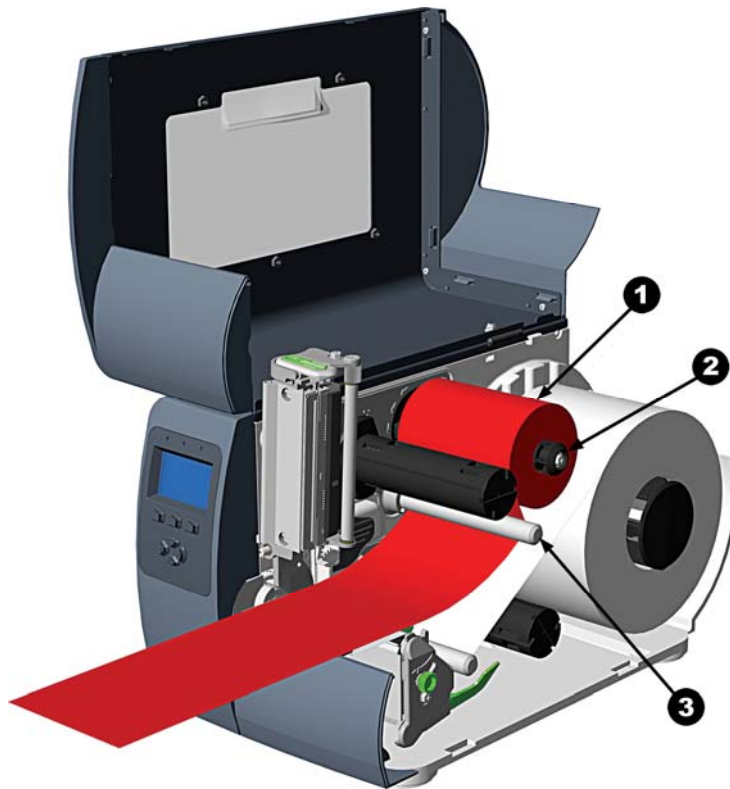
❶	Ribbon Roll
❷	Ribbon Supply Hub
❸	Ribbon Idler

4. Close the Printhead Assembly and press down until it locks into place.
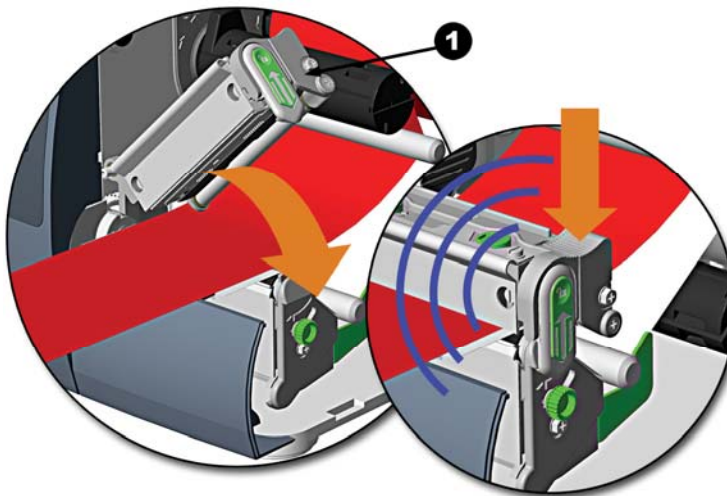
❶	Printhead Assembly

5. Route the ribbon up and then around to the Ribbon Take-Up Hub, winding it several times in a clockwise direction to secure it in place.

❶   Ribbon Take-up Hub
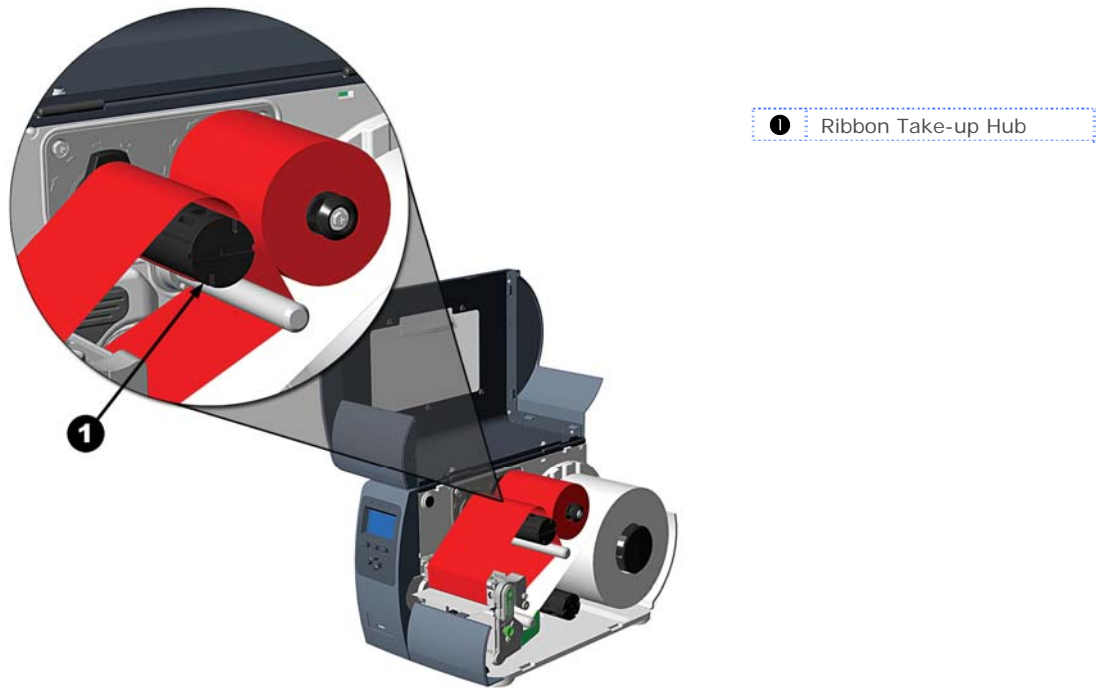
6. Close the cover and press the Feed button several times to position the ribbon and ensure proper tracking.

3 **Printer Operation**

3.1 Front Panel (Non-Display Printers)

The Front Panel consists of three indicator lights and three function buttons. The functions of these lights and controls are listed in the following sections.

Non-display printers can be configured using the DMXConfig Utility (see Section 3.4). The printer can also be configured using the Paper Menu Setup, (see Appendix C) for users that do not have a host connection available.

3.1.1   Lights

(Normal power-up)

Normal Mode

⊖ STOP — **Solid On:** *Indicates the printer is in the 'Paused' state*

Flashing: *(When using the Peel & Present Option) Indicates a label is presented to the operator.*

⊘ ERROR — *Indicates a top of form or mechanical error has occurred*

READY ⏻ — **Solid On:** *Indicates the printer is on and ready for printing*

Flashing: *Indicates the printer is receiving data from the host*

▪ Both the READY ⏻ and ⊖ STOP Lights will be on during power-up initialization.

3.1.2 Buttons

⊗ PAUSE , ⊗ FEED , and ⊗ CANCEL perform different functions based on the operational mode.

Ready Mode Functions

These functions can be performed at any time when the printer is at idle.

Function	Button(s)	Description
Pause	Pause	Pauses and un-pauses the printer
Feed / Clear Fault	Feed	Feeds one label or clears fault condition
Cancel	Cancel	Cancels the current batch of labels. Press the Pause button to print the next batch of labels in the printer's buffer.
Soft Reset	Press and Hold Pause & Cancel	Resets the printer, see Section 5.8
Print Test Label	Pause & Feed	Prints the Test Label
Print Configuration Label	Feed & Cancel	Produces Database Configuration and Test Label
Print Ethernet Label	Pause, Feed & Cancel	Prints the printers Ethernet configuration
Quick Calibration	Press and Hold Feed	Performs a "Quick Calibration", see Section 3.5
Empty Calibration	Press and Hold Pause & Feed	Performs a "Empty Calibration", see Section 3.5

Delayed Power-up Functions

Turn on the printer, when the three lights turn on press and hold the button sequence. Continue to hold the button(s) until the three lights turn off.

Function	Button(s)	Description
Reset Ethernet	Hold Pause & Feed & Cancel	Resets the Ethernet settings to default values
Hex Dump	Feed	Enters Hex Dump Mode, see Section 6.3
Level 1 Reset	Pause & Cancel	Resets the printer to a saved configuration file, see Section 5.8.
Level 2 Reset	Pause, Feed & Cancel	Resets the printer to the default factory settings, see Section 5.8.

3.2 Front Panel (Display-Equipped Printers)

The Control Panel is an event-driven interface composed of a graphic display and keyboard. In addition to providing current printer information, the mode-dependent panel allows the items in the Main Display Area and the keyboard functions to change as operational events require.
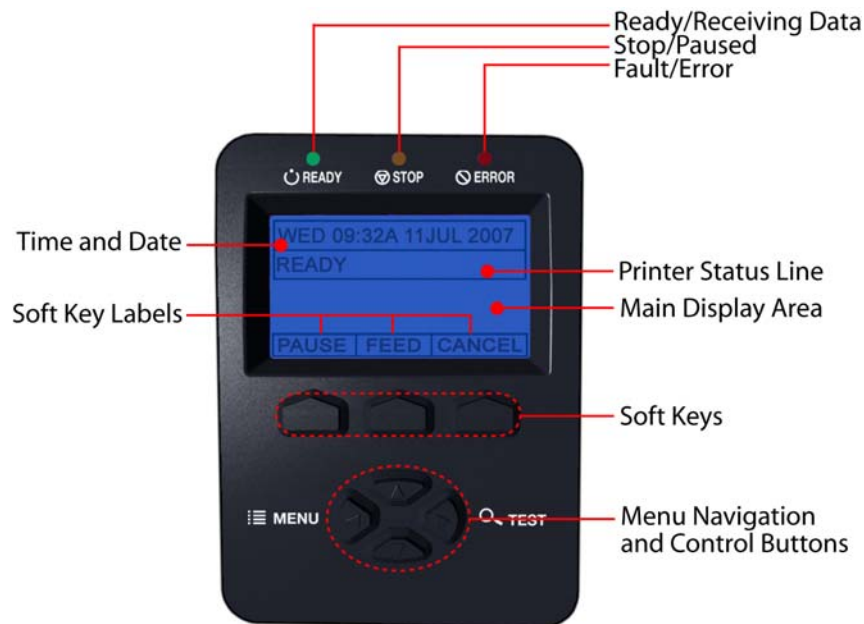
Icons & Indicators

The icons are graphics that appear in the 'Printer Status Line' area of the display. Three LED indicators are located above the display. Both provide real-time operational information as defined below:

Item	Definition
USB / SD	A USB Host or SD device (memory drive or keyboard) has been detected
RFID	RFID is installed
(wired LAN icon)	A wired LAN connection has been detected
(WLAN icon)	WLAN is enabled and the printer s NOT associated with a WLAN Access Point
(WLAN icon)	Printer WLAN is associated with an WLAN Access Point
(ADHOC icon)	WLAN is in ADHOC mode
DPL	DPL mode selected
LINE	LINE mode selected
PL-Z	PL-Z mode selected
(zoom icon)	Enhanced Display Mode – Applies a "zoom" feature for easier viewing. From the Ready screen, press and hold the down button to toggle on and off.
(green LED)	The printer is receiving data
(orange LED)	The printer is stopped or paused
(red LED)	A Fault condition has been detected. For a listing of possible messages, see Section 6.2

3.3 Windows Driver

The Windows driver is located on the Accessories CD-Rom included with your printer. For the latest version please visit our web site at www.datamax-oneil.com.

Installing the Windows Driver:
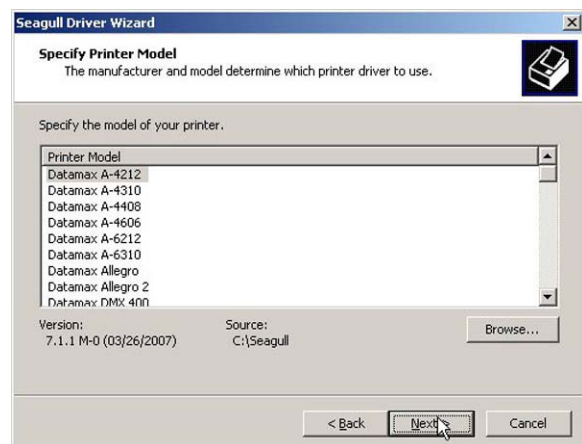
Place the Accessories CD-Rom included with your printer into your computers CD-Rom drive.

Once the CD-Rom starts select "Install Windows Driver" from the main menu and follow the instructions on the screen to install.

When prompted, select your printer from the list, (i.e. Datamax-O'Neil M-Class MarkII). Continue to follow the on-screen instructions to install the driver.

Important Notes:

The Windows driver functions the same as any other Windows printer. A built in help file is available for complete information on all settings; however, there are some important settings that should be observed for trouble free printing.

Page Setup Tab: Stock

It is important that the Stock setting matches the size of the label you are using. If you cannot find a match for your label click 'New' and enter the dimensions of your label.
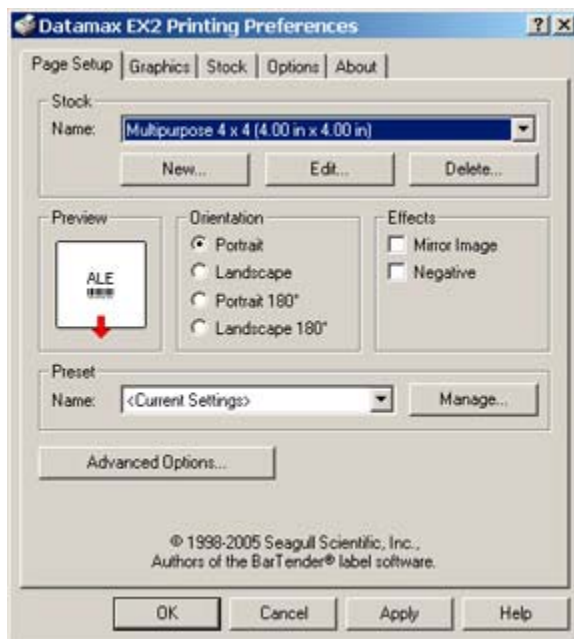
Options Tab: Print Speed & Printhead Temperature

These two settings will have the greatest effect on print quality. Some label stocks will require more heat and slower print speeds to generate a quality image.
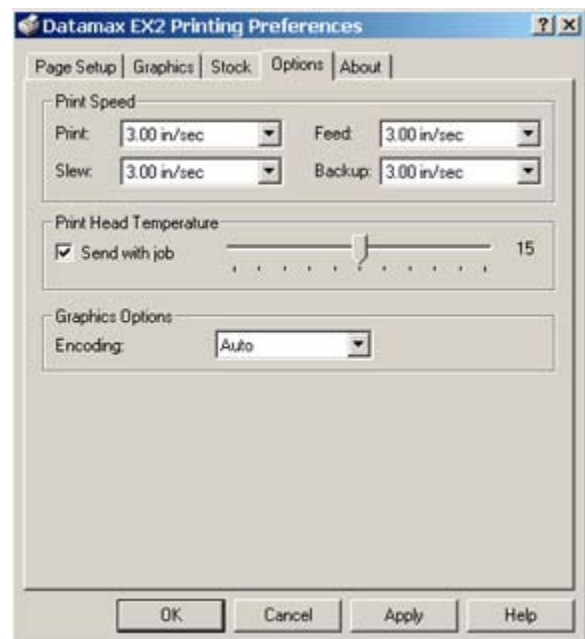
The Windows application software used to create the label format will likely have a "Page Setup" screen. This will also need to match the size of the label you are using.

3.4 Printer Configuration Utility (DMXConfig)

DMXConfig (located on the Accessories CD-ROM) is a Windows based configuration utility that allows you to make changes to the existing printer setup via a direct connection to the host computers serial and parallel connection.

DMXConfig Features:

- Allows Real-Time Control/Query of Printer Configuration
- Define and Save Optimal Configurations for Applications
- Saved Configurations can be Shared with other Printers and Sent via Email
- Download Files, Formats and Fonts
- Query Memory Modules

☑️ Be sure to use the DMXConfig utility located on the Accessories CD-Rom that is included with your printer. Older versions might not operate correctly with some printers. For the latest version please visit our web site at www.datamax-oneil.com.

Once you have installed the DMXConfig utility:

1. Connect the host to the printer with a serial or parallel cable.

2. Turn on the printer.

3. Launch the DMXConfig utility.

4. Query the printer by using the 'Query Printer' toolbar button (top-left). This will connect to the printer and get the current printer settings.

5. At this point you may browse the tabs and make any changes necessary to the printer configuration. Once complete, send the new settings to the printer using the 'Configure Printer' toolbar button. The example below illustrates changing the Media Type setting to "Thermal Transfer.

6. Select the 'Media Settings' tab, in the 'Media Type' drop-down box select 'Thermal Transfer'.

7. Send the settings to the printer using the 'Configure Printer' toolbar button.

The printer is now configured to 'Thermal Transfer'. You may close the DMXConfig utility and begin printing using ribbon.
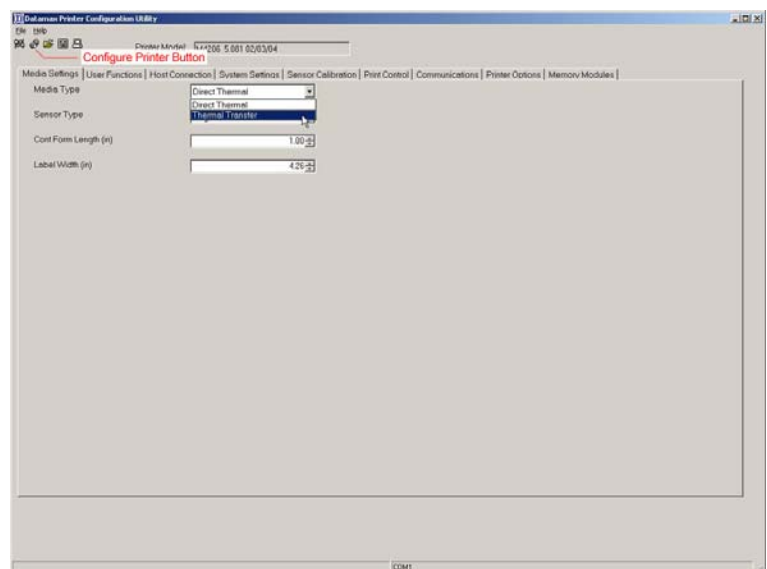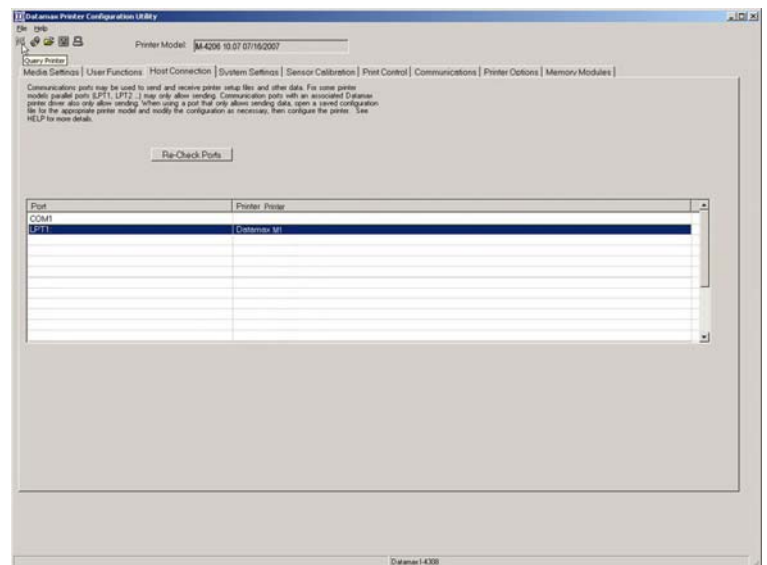
3.5 Media Calibration

3.5.1   Quick Calibration

Quick Calibration should be performed as part of the media loading routine to fine-tune the sensing parameters.

✅ (1) This calibration is not necessary when using continuous stock.

(2) Media containing large gaps may require a change in the PAPER EMPTY DISTANCE before proceeding.

Calibrate the printer as follows:

1. Ensure that the printer is ON and in an idle state (i.e., not off-line) with media loaded, the media sensor adjusted, and the sensor type selected.

2. Press and hold the FEED Key until one label has been output then release the key and wait for the printer to process the data. There are two possible outcomes:

    Non-Display Printers:

    Upon completion, one of the following lights will flash five times to denote the result of the auto calibration attempt:

    ⊘ STOP Light = Successful calibration.

    ⊘ ERROR Light = Unsuccessful calibration, try again. If the calibration continues to fail proceed to Section 3.5.3.

    Display-Equipped Printers:

    CALIBRATION COMPLETE - will be displayed, and the media will be advanced to the next top of form if calibration was successful; or,

    CANNOT CALIBRATE will be displayed if calibration was not successful. In this case, check the hints listed below to help resolve the problem:

Calibration Hints:

WARNING LOW BACKING *(display-equipped printers)* is a normal message when calibrating die-cut media mounted on a highly translucent liner or notched tag stocks.

If the initial attempt fails, press and hold the FEED Key until two successive label TOFs have been output. If, however, CANNOT CALIBRATE is displayed again, perform the Standard Calibration routine, see Section 3.5.3.

3.5.2   Empty Calibration

Empty Calibration calibrates the printer's media sensor to detect an 'Out of Stock' condition. Calibrate the printer as follows:

1. Ensure that the printer is ON and in an idle state (i.e., not off-line) with media removed.

2. Press and hold the Pause & Feed Key for a few seconds.

3.5.3   Standard Calibration

The Standard Calibration can be performed using the DMXConfig Utility (see Section 3.4) and using the front panel buttons (see Appendix C). On display-equipped printers the Standard Calibration routine can also be initiated via the printer's menu, see Section 4.5. Once you have installed the DMXConfig utility and the printer is properly loaded with media:

1. Connect the host to the printer with a serial or parallel cable.

2. Turn on the printer.

3. Launch the DMXConfig utility.

4. Query the printer by using the 'Query Printer' toolbar button (top-left). This will connect to the printer and get the current printer settings.

5. Select the "Sensor Calibration" Tab and then click the "Media Calibration Wizard" button. When prompted click "OK" to start the calibration wizard.

6. The Calibration Wizard will now prompt you to 'Load Stock'. Be sure the media is properly loaded in the printer. Close the printhead and click "OK".
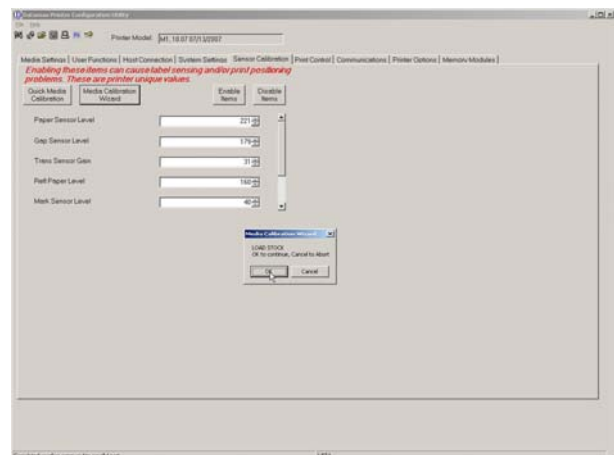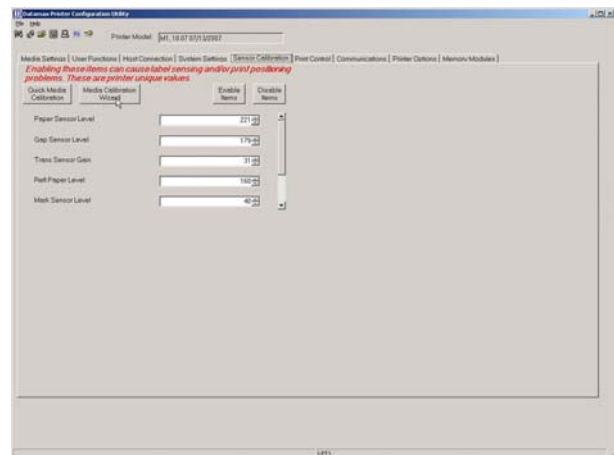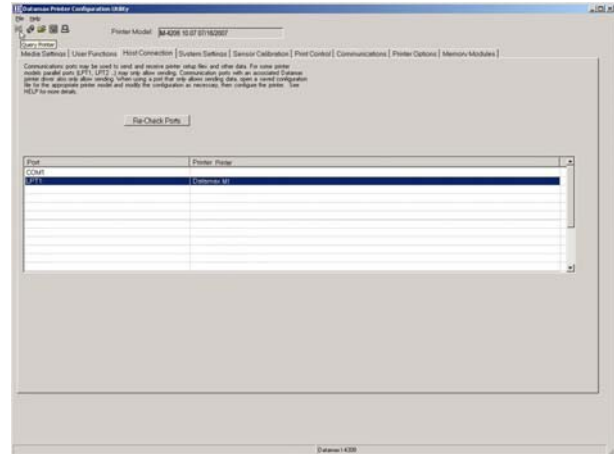
7. The Calibration Wizard will now prompt you to 'Load Backing'. Peel off a few labels and position the backing material in the media sensor. Close the printhead and click "OK".
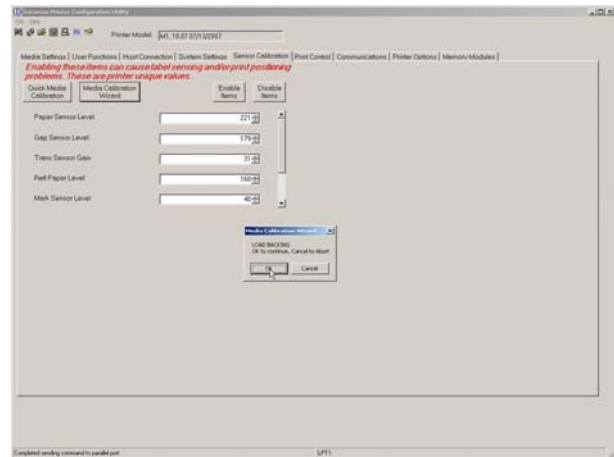
8. The Calibration Wizard will now prompt you to 'Remove Stock'. Remove all media and backing from the printer. Close the printhead and click "OK".
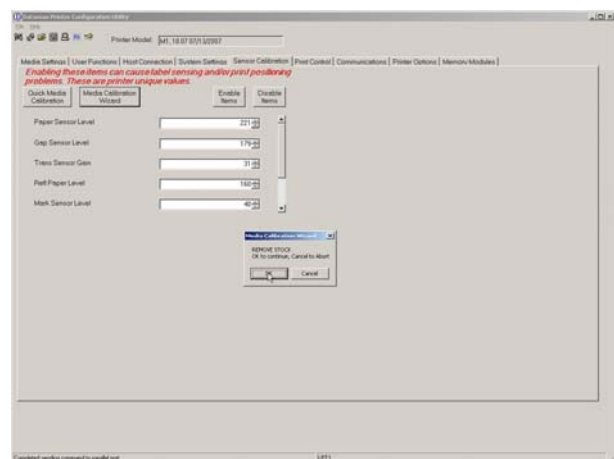
9. The Calibration Wizard will now respond with 'Passed Calibration', click "OK." Re-install the media in the printer. Close the printhead and press the Feed button to test the calibration. Each press of the Feed button labels should feed one label.

   If the printer was unsuccessful in calibrating. Retry the procedure beginning at Step 5.
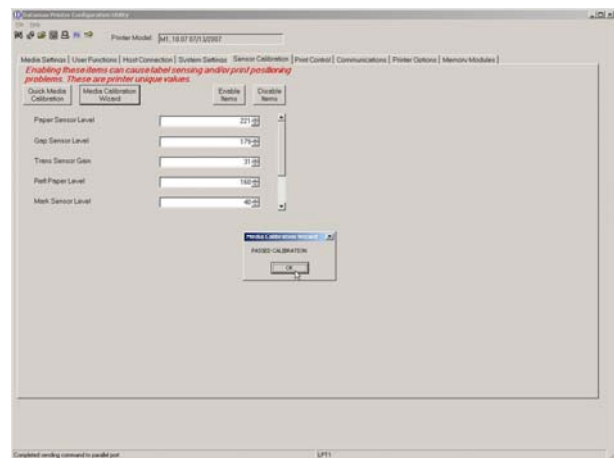
3.6 User-Defined Label

The User-Defined Label allows a template to be populated by variable data (via the printer's control panel or a USB QWERTY keyboard). The template is a stored label format, where fields delimited by an ampersand (&) become variable.

The printer will prompt you to enter the variable field data. For example, the stored label format could contain the data 19131423443&ENTER NAME&

Afterward, when recalled from memory, the display will indicate the variable field: ENTER NAME

- *Variable data can be any part of the DPL format - font ID, positioning, etc.*

- *No error checking will be performed.*

- *Supports `.dlb`, `.dpl`, `.prn`, and `.txt` file types.*

---

4 Menu System

4.1 Menu System (Display-Equipped Printers)

The Menu System contains three primary branches, each with a differing level of access to secondary menus or functions:

- The User Menu accesses basic printer settings and functions;
- The Advanced Menu accesses all operational settings, functions, and diagnostics; and,
- The Test Menu accesses a menu of test, user-defined, and previous label printing functions.

(1) Entering the Menu System takes the printer OFF-LINE and stops the processing of new data.

(2) Prompts may appear before menu access is granted and before changes are enacted; see Security for details.

☑ (3) Display contrast is adjustable: press and hold the MENU BUTTON to cycle through the contrast range (this may take several seconds) then release the button when the desired appearance has been achieved.

(4) The Menu System described below details functions available when the printer firmware is at Application Version 12.071 or greater. Print a Configuration Label to identify your printer's current version of firmware. To upgrade the firmware, visit our website http://www.datamax-oneil.com/

The multi-purpose **Menu**, **Test**, and **Navigation Buttons** allow Menu System entry, negotiation, and parameter selection functions:
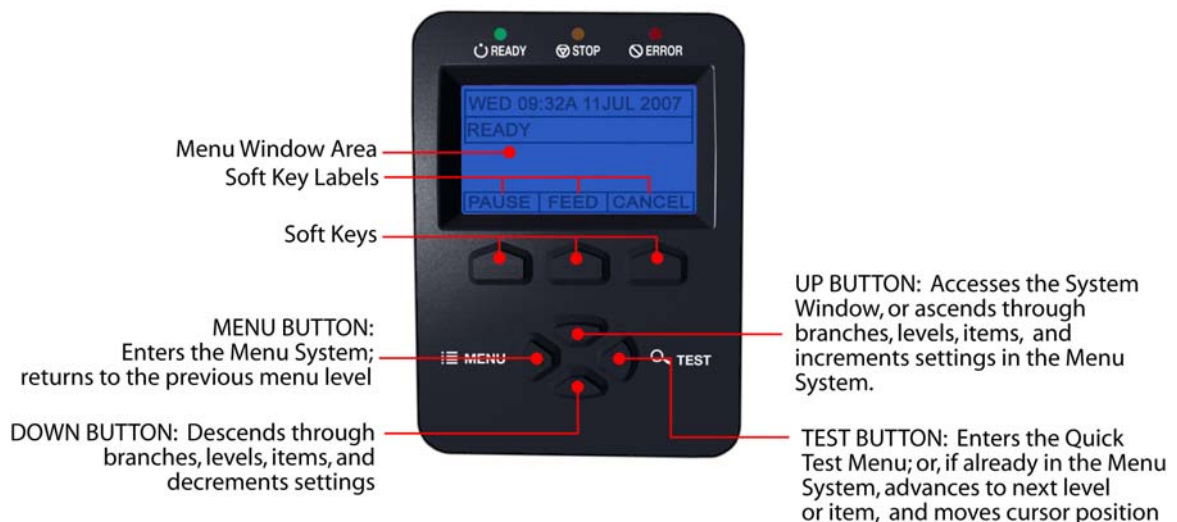
- To print a label from the Test Menu, press the **TEST BUTTON**; and,

- To change printer settings or perform diagnostics, press the **MENU BUTTON** then observe the **MENU WINDOW AREA** for available selections. (When the number of selections present is greater than can be shown, use the **UP** or **DOWN BUTTONS** to view those additional items. Also, **SOFT KEY LABELS** are dynamic and change to denote the current associated **SOFT KEY** functions.)

4.2 The User Menu

The User Menu contains basic selections in these menus:

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

☑ (1) Some setting changes will only become effective (and saved) after selecting YES at the Save Changes prompt.

(2) Labeling software may, in some cases, override the printer menu settings; see Advanced Menu for details.

4.3 The Advanced Menu

The Advanced Menu contains all setting, control, and functional selections in these menus:

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

After selecting the Advanced Menu, it will be accessed whenever the **MENU BUTTON** is pressed. To enable the Advanced Menu, proceed as follows:

1. Press the MENU BUTTON.

2. Using the UP or the DOWN BUTTON, scroll to SYSTEM SETTINGS then press the ENTER KEY.

3. Scroll to MENU MODE then press the ENTER KEY.

4. Scroll to ADVANCED MENU then press the ENTER KEY. (Upon completion, OK will be displayed and the printer will exit the menu system.)

☑ (1) Some setting changes will only become effective (and saved) after selecting YES at the Save Changes prompt.

(2) Labeling software may, in some cases, override the printer menu settings; see Advanced Menu / Communications / Host Settings to avoid potential conflicts.

(3) To return to the User Menu, re-select it or restore the factory defaults.

4.4 The Test Menu

The Test Menu contains test and informational label selections:

- Print Quality Label
- Ribbon Test Label
- Test Label
- Validation Label
- Print Configuration
- Print Last Label
- User Defined Label

Internally generated, these labels are printed at pre-selected media type, speed, and heat settings. Changes to these print settings can be made via the Menu System or through host commands. When printing, use full width media to capture the entire format; otherwise, adjust the printer and set the Label Width.

☑ (1) Press the CANCEL KEY to stop printing.

(2) A printing delay can be set; see Print Test Rate (in Diagnostics).

4.5 Menu Details

Media Settings

The Media Settings menu contains label and ribbon sensing and sizing functions, as well as printhead cleaning selections:

- Media Type
- Sensor Type
- Label Length
- Maximum Label Length *
- Paper Empty Distance *
- Label Width
- Ribbon Low Options *
- Sensor Calibration *
- Printhead Cleaning *

☑ Items denoted with an asterisk (*) are only accessible through the Advanced Menu.

The menu selections are defined on the following pages:

DISPLAYED ITEM	ITEM DESCRIPTION
MEDIA TYPE	Selects the method used to print labels and should be set according to the type of media being used, where:
DIRECT THERMAL	Sets use for media that is heat reactive to produce an image.
THERMAL TRANSFER	Sets use for media that requires a ribbon to produce an image.
SENSOR TYPE	Selects the top-of-form (TOF) sensing method used to determine the leading edge of the label, where:
GAP	TOF will be recognized by sensing the gaps or notches in the media. (Default Setting)
CONTINUOUS	No TOF sensing will be used; instead, LABEL LENGTH (in Media Settings) is used.
REFLECTIVE	TOF will be recognized by sensing the reflective (black) marks on the underside of the media.
LABEL LENGTH	Determines the length of the label (0 - 99.99 inches) when the SENSOR TYPE is set to CONTINUOUS, where:
04.00	Is the default setting.
MAXIMUM LABEL LENGTH	Sets the distance (0 - 99.99 inches) that the printer will feed media to find TOF (when the Sensor Type is set to GAP or REFLECTIVE) before a TOF Fault is declared, where:
16.00	Is the default setting.

☑   Maximum Label Length should typically be 2.5 to 3 times the physical length of the label.

PAPER EMPTY DISTANCE	Sets the distance (0 - 99.99 inches) the printer will attempt to feed before an Out Of Stock Fault is declared, where:
00.25	Is the default setting.

☑   When using clear or translucent media, this setting should be longer than the actual label size.

LABEL WIDTH	Sets the maximum printable width. Objects extending beyond this setting will NOT print, where:
x.xx	Default setting is dependant on printer model.
RIBBON LOW OPTIONS	Defines the printer response when THERMAL TRANSFER mode is selected and the ribbon supply begins to diminish.
RIBBON LOW DIAMETER	Sets the ribbon supply threshold diameter (1.00 - 2.00 inches) that will trigger a Low Ribbon Warning prompt, where:
1.38	Is the default setting.
PAUSE ON RIBBON LOW	Allows the printer to enter a paused condition when Ribbon Low Diameter is met, where:
ENABLE	Pauses when a Ribbon Low Diameter condition is detected; the PAUSE Key must be pressed to proceed with the print job.
DISABLE	No action is required by the operator; printing can continue until a Ribbon Fault is declared. (Default Setting)

SENSOR CALIBRATION		Selects the media sensor calibration method, where:
	PERFORM CALIBRATION	Sets the values via internal printer calculations, as described in the STANDARD CALIBRATION procedure.
	ADVANCED ENTRY	Sets the values via manual entry (typically for hard to calibrate label stocks), as described in the ADVANCED ENTRY CALIBRATION where:
	PAPER SENSOR LEVEL	Establishes the threshold for the paper value (0 - 255), where 170 is the default setting.
	REFL PAPER LEVEL	Establishes the threshold for the reflective value (0 - 255), where 170 is the default setting.
	GAP SENSOR LEVEL	Establishes the threshold for the gap value (0 - 255), where 040 is the default setting.
	MARK SENSOR LEVEL	Establishes the threshold for the mark value (0 - 255), where 040 is the default setting.
	EMPTY SENSOR LEVEL	Establishes the threshold for the empty value (0 - 255), where 000 is the default setting.
	TRAN SENSOR GAIN	Establishes the sensitivity of the transmissive sensor (0 - 31), where 15 is the default setting.
	REFL SENSOR GAIN	Establishes the sensitivity of the reflective sensor (0 - 31), where 15 is the default setting.
PRINTHEAD CLEANING		Controls the automatic cleaning alert and function, where:
	CLEAN HEAD SCHEDULE	Specifies the inch (or centimeter) count at which to clean the printhead, and if exceeded three times, declare a Head Cleaning Fault. (Note that the specified count [0 - 200 inches] will be multiplied by one thousand, and that zero [the default setting] will disable the function.)
	CLEAN HEAD COUNTER	Indicates the number of inches (or centimeters) since a cleaning was last initiated.
	RESET COUNTER	Resets the Clean Head Counter to zero to restart the Clean Head Schedule.
	CLEAN HEAD NOW	Initiates the cleaning process and resets the Clean Head Counter.

Print Control

The Print Control menu contains printing throughput, offset and custom setup functions:

- Heat
- Print Speed
- Feed Speed
- Reverse Speed *
- Slew Speed *
- Row Offset
- Column Offset
- Present Distance
- TOF Precedence
- Custom Adjustments *

✅ Items denoted with an asterisk (*) are only accessible through the Advanced Menu.

The menu selections are defined as follows:

DISPLAYED ITEM	ITEM DESCRIPTION
HEAT	Controls the burn time (0 - 30) of the printhead (and is equivalent to the Heat setting in many software labeling programs), where:
10	Is the default setting.
PRINT SPEED	Controls the rate of label movement during printing, where:
x.x in/sec	

✅ On M-4210 models equipped with a Media Hanger in place of a Media Hub, high print speeds may result in printing degradation. It is recommended to set the print speed at 8ips or less.

FEED SPEED	Controls the rate of label movement between printing areas, where:
x.x in/sec	
REVERSE SPEED	Controls the rate of label movement (2.0 - 5.0 inches per second) during backup positioning, where:
4.0 in/sec	Is the default setting.
SLEW SPEED	Controls the rate of label movement (2.0 - 16.0 inches per second) between printing areas when using the GPIO function, where:
x.x in/sec	
ROW OFFSET	Shifts the vertical start of print position (0 - 99.99 inches) on the label, where:
00.00 in.	Is the default setting.
COLUMN OFFSET	Shifts the HORIZONTAL, left-justified start of print position to the right (0-99.99 inches), without shifting the LABEL WIDTH termination point to the right, where:
00.00 in.	Is the default setting.

PRESENT DISTANCE		Sets the label stop position (0 - 4.00 inches) past the start of print position upon output. When subsequent label formats are received, the printer will automatically back up the label to position it at the start of print position, where:
	AUTO 0.00 in.	Is the default setting (Auto Mode). In Auto Mode, the printer automatically configures this distance according to the positioning requirements of the attached device (i.e., tear bar, cutter, peel & present mechanism, or present sensor).

☑ When set to 0.01 in., NONE is assumed and a zero (0) positioning value will be used.

TOF PRECEDENCE		Allows an override of label format data when the form length is exceeded, where:
	DISABLE	Prints labels formats without TOF truncating.
	ENABLE	Ends the label at the next TOF, truncating any print data that extends past this mark.
CUSTOM ADJUSTMENTS		Changes the factory adjustment parameters to finely and independently compensate for slight mechanical differences sometimes evident when multiple printers share label formats. These settings are also available to make special label formatting adjustments, where:
	DARKNESS	Controls the strobe time (1 - 64) to establish the nominal HEAT setting for printhead-specific thermal characteristics, where:
	32	Is the default setting.
	CONTRAST	Allows fine-tuning (1 - 64) of the gray adjustment for print quality, where:
	32	Is the default setting.
	ROW ADJUST	Shifts the vertical start of print position (in xxx dots) to fine-tune the ROW OFFSET setting, where:
	+0000	If shifting Row Adjust in the negative direction, modify the PRESENT ADJUST setting (see below) by that same amount.
	COLUMN ADJUST	Shifts both the horizontal start of print position and the LABEL WIDTH termination point to the right (in xxx dots) to fine-tune the COLUMN OFFSET setting, where:
	+000 (-100 – 100 DOTS)	Is the setting.
	PRESENT ADJUST	Adjusts the label stopping position (in xxx dots) to fine-tune the PRESENT DISTANCE setting, where:
	+000 (-100 – 100 DOTS)	Is the setting.

Printer Options

The Printer Options menu contains file-handling, module, and optional equipment settings:

- Modules
- Present Sensor
- Cutter
- RFID
- GPIO Port

☑ Items denoted with an asterisk (*) are only accessible through the Advanced Menu; also, certain selections will appear only when equipped with that option.

The menu selections are defined as follows:

DISPLAYED ITEM	ITEM DESCRIPTION
MODULES	Controls memory handling functions, where:
DIRECTORY *	Allows viewing and printing of the available space and file types (including plug-in files) present on a module. Only detected modules will be listed, and selecting ALL will display all results. (See the *Class Series 2 Programmer's Manual* for memory allocation information.)
PRINT FILE	Prints selections from stored file types:

File Extension	Printed Result
DBM	A font sample.
DCM	The configuration commands contained in the file.
DIM	The image.
DLB	The stored label.
DLN	The name of the language.
DMS	The database contained in the file for RFID.
DPL	A label format, if detected.
DTT	A font sample.
PLU	The names of the files contained in the plug-in directory.
PRN	Is processed as a DPL file.
TXT	Is processed as a DPL file.

DISPLAYED ITEM	ITEM DESCRIPTION
PROCESS FILE *	Selects from a list of available files for processing (as noted below); also, see Section 5.10, File Handling Messages:

External File Extension	Definition / Action	Converted Internal Extension
BMP, PCX, IMG, & F7B	Converts the black and white graphics file, image flip assumed, and then stores the result in Module G.	DIM
BS	Upgrades the printer boot-loader.	---
DPL	If detected, a label format is printed.	---
LS	Converts the translated message file, and then stores the result in Module Y.	DLN
PLG	Converts the plug-in file, and then stores the result as specified by the file (typically Module X).	PLU
SFL & SFP	Converts the bit-mapped font file and then stores the result in Module G, where the last three characters of the name will correspond to the Font ID. (If the filename does not contain a Font ID, you will be prompted to enter it.)	DBM
TTF	Converts the true-type / scalable font file and then stores the result in Module G, where the last two characters of the name will correspond to the Font ID. (If the filename does not contain a Font ID, you will be prompted to enter it.)	DTT
ZS	Upgrades the printer firmware.	---

FORMAT MODULE *		Selects from a list of modules available for formatting by the printer; see Section 5.10, File Handling Messages. Choosing FORMAT MODULE will erase existing data in the selected module
DELETE FILE *		Selects from the list of available files for deleting; see Section 5.10, File Handling Messages.
COPY FILE *		Selects from the list of available files for copying, prompting you for the destination module before execution; see Section 5.10, File Handling Messages.
UNPROTECT MODULE *		Selects from the list of available modules to unprotect, and then prompting you regarding the outcome of the attempt; see Section 5.10, File Handling Messages.
PRESENT SENSOR		Controls the "on-demand" dispensing of labels , where:
	MODE	Sets the detection method and response of the printer:
	AUTO	Is the default setting. Automatically detects, enables the Present Sensor (or Peel and Present mechanism) and sets the label stop location; if not detected, the operation will be ignored.
	ENABLED	Enables the Present Sensor (or Peel and Present mechanism) and sets the label stop location; if not detected, a fault will be generated.
	DISABLED	Disables the option.
	RETRACT DELAY *	Programs a time delay for the retraction of the next label in the print process, where:
	(1 - 255 x 10 mS) 070	Is the range, times 10 milliseconds; and, Seventy (times ten) is the default setting.
CUTTER		Controls the Cutter operation, where:
	MODE	Sets the detection method and response of the printer:
	AUTO	Is the default setting, where the presence of the cutter option is automatically sensed. If detected, the cutter is enabled; otherwise, it will be ignored.
	ENABLED	Enables the cutter. If the cutter is not detected, a fault will be generated.
	DISABLED	Disables the cutter.
	CUT BEHIND	Allows a queue of small labels to accumulate before cutting is performed to increase throughput. ☑ (1) This mode can be used without a cutter to allow the presentation of an extra label with retraction upon the next job or feed operation. (2) After a fault or unknown label position, the leading edge will be cut to ensure no extra material exists at the beginning of the first label; otherwise, the cutter will only cut when necessary.
	(0 – 2) 0	Zero, one, or two are the number of labels to queue before cutting; and Is the default setting.
RFID		Controls the programming and verification of RFID tags, where: ☑ If not installed (or detected), this selection will result in a DISABLED message.
	RFID MODULE	Sets the mode of RFID operation, where:
	DISABLED	Disables the option.
	HF	Selects the High Frequency (13.56 MHz) RFID option.
	UHF MULTI-PROTOCOL	Selects the Ultra High Frequency (868-956 MHz) RFID option.
	RFID POSITION*	Sets the RFID inlay location.
	(1.10 - 4.00 IN.) 1.10	This location is referenced from the leading edge of the label or tag, as it moves forward through the printer. Is the default setting.

HF SETTINGS *		Sets HF tag parameters, as follows:
	TAG TYPE	Sets the tag type: ISO 15693 (Is the default setting.) TI PHILIPS ST LRI512 ST LRI64
	AFI VALUE	Application Family Identifier value (00 - FF), where 00 is the default value.
	AFI LOCK	Application Family Identifier lock (ENABLED / DISABLED), where DISABLED is the default setting.
	DSFID VALUE	Data Storage Format Identifier (00 - FF), where 00 is the default value.
	DSFID LOCK	Data Storage Format Identifier lock (ENABLED / DISABLED), where DISABLED is the default setting.
	EAS VALUE	Electronic Article Surveillance value (00 - FF), where 00 is the default value.
	AUDIO INDICATOR	Controls the buzzer (ENABLED / DISABLED), where DISABLED is the default setting.
	ERASE ON FAULT	Erases the tag when errors are detected (ENABLED / DISABLED), where DISABLED is the default setting.
UHF SETTINGS *		Sets UHF tag parameters, as follows:
	TAG TYPE	Sets the tag type: EPC 0 EPC 0+ MATRICS EPC 0+ IMPINJ EPC 1 UCODE EPC 1.19 EM 4022/1222 GEN 2 (Is the default setting.)
	TAG DATA SIZE	Sets the tag data size: 96-BIT (Is the default setting.) 64-BIT
	POWER ADJUST	Adjusts the applied power.
	KILL CODE	Code used to permanently deactivate the device: B3 B2 B1 B0 00 00 00 00 (Is the default setting.)
	ACCESS CODE	Code used to protect the memory contents: B3 B2 B1 B0 00 00 00 00 (Is the default setting.)
	GEN 2 LOCK ACTION	Sets the lock level (NONE, PERMALOCK, PWD-READ/WRITE, BOTH), where NONE is the default setting.
LOCK AFTER WRITE *		Locks the tag after programming.
	ENABLED	The tag will be locked.
	DISABLED	No locking occurs (default setting).
RETRY ATTEMPTS *		Sets the number of retry attempts, where:
	(0 - 9) 3	Zero to nine are the number of retries; and, Is the default setting.
PERFORM CALIBRATION *		Allows the printer to establish the tag to transducer distance setting and nominal RFID power requirements.
	YES	Initiates the process. The CALIBRATING RFID message will appear as the printer feeds media to begin scanning for the RFID tag location. Once the location is established, power calibration begins. Upon completion, the media will be retracted to the TOF position; the calibrated position and power results (along with a brief SUCCESS or FAILURE message) will be displayed; and, the printer's database will be updated with the new calibration parameters.
	NO	Terminates the process.

SET DEFAULTS *	Depending upon the RFID MODULE, selecting YES will return these settings: If MODE = HF, then: RFID POSITION = 1.10 HF SETTINGS: TAG TYPE = ISO 15693 RETRY ATTEMPTS = 3 --- If MODE = UHF, then: RFID POSITION = 1.10 UHF SETTINGS: TAG TYPE = GEN 2; TAG DATA SIZE = 96-BIT RETRY ATTEMPTS = 3	
GPIO PORT		Controls the optional Applicator Interface Card's GPIO function, where:
	GPIO DEVICE	Sets the option to work with a specific device type, where:
		DISABLED	Disables the option.
		APPLICATOR	Enables the following GPIO parameters for label applicator functions: • De-asserts Data Ready (DRDY) when the last label starts printing to indicate completion; • FEED allowed at any time; and, • Does not de-assert DRDY upon PAUSE.
		BARCODE VERIFIER	Enables the GPIO Port to work with a bar code verifier.
	START OF PRINT	Selects the type of input signal required to initiate Start of Print (SOP), where:
		LOW PULSE	Triggers printing with a low pulse.
		HIGH PULSE	Triggers printing with a high pulse.
		ACTIVE LOW	Triggers printing with a low signal.
		ACTIVE HIGH	Triggers printing with a high signal.
		EDGE	Triggers printing with a signal edge transition.
	END OF PRINT	Sets the type of output signal generated to indicate End of Print (EOP), where:
		LOW PULSE	Outputs a low pulse upon completion.
		HIGH PULSE	Outputs a high pulse upon completion.
		ACTIVE LOW	Outputs a logic low upon completion.
		ACTIVE HIGH	Outputs a logic high upon completion.
	SLEW ENABLE	Selects the type of input signal required to initiate label slew, where:
		STANDARD	Triggers slew with a low signal.
		LOW PULSE	Triggers slew with a low pulse.
		HIGH PULSE	Triggers slew with a high pulse.
		ACTIVE LOW	Triggers slew with a low signal.
		ACTIVE HIGH	Triggers slew with a high signal.

System Settings

The System Settings menu contains label formatting, operation, and control functions:

- Menu Mode
- Configuration File
- Internal Module *
- Default Module *
- Scaleable Font Cache *
- Single Byte Symbols *
- Double Byte Symbols *
- Time And Date
- Media Counters *
- Print Configuration *
- Configuration Level *
- Set Factory Defaults *
- Format Attributes *
- Label Rotation
- Imaging Mode *
- Pause Mode *
- Peel Mode *
- Security *
- Units Of Measure *
- Input Mode *
- User Label Mode *
- DPL Emulation *
- Column Emulation *
- Row Emulation *
- SOP Emulation *
- Back After Print *
- Font Emulation *
- Label Store *
- Menu Language
- Graphic Display Mode*
- Fault Handling *
- SCL Font Bold Factor*

☑ Items denoted with an asterisk (*) are only accessible through the Advanced Menu.

The menu selections are defined as follows:

DISPLAYED ITEM	ITEM DESCRIPTION
MENU MODE	Sets the menu system access level, where:
USER MENU	Accesses a limited menu of basic controls. (Default Setting)
ADVANCED MENU	Accesses the full menu of controls, settings, and diagnostics.
CONFIGURATION FILE	Controls the creation, storage, and recall of printer configuration files, where:
RESTORE AS CURRENT *	Returns the printer to a previously saved configuration.
SAVE SETTING AS	Creates a file based on the current printer configuration, as described here.
DELETE FILE *	Removes a selected configuration file from memory. (An active file cannot be deleted.)
FACTORY SETTING FILE *	Provides a list of available configuration files used to restore the printer's configuration following a Level One Reset or when YES is selected in the SET FACTORY DEFAULTS menu. (NONE is the default file setting.)

INTERNAL MODULE D	Sets the number of 1KB blocks (100 - 5120) allocated for the internal DRAM 'D' module, where:
1024	Is the Default Setting.
DEFAULT MODULE	Designates the memory module to be used for file storage when none are specified, where:
D	Is the Default Setting (DRAM module).
G	Flash module.

✓ The available modules may vary depending upon printer model and options.

SCALEABLE FONT CACHE	Configures the number of 1KB blocks (100 - 5120) allocated for the scaleable font engine, where:
0511 KBytes	Is the Default Setting.

✓ The available memory may vary depending upon printer model and options.

SINGLE BYTE SYMBOLS	Selects the code page used to print single byte fonts, including:	

ARABIC-8	ISO 15: ITALIAN	ISO 17: SPANISH
CYRILLIC	LEGAL	ISO 11: SWEDISH
ISO 60: DAN/NOR	HP4000 ZAPF DINGBAT	SYMBOL
DESKTOP	MATH-8	TURKISH-8
ITC ZAPF DINGBAT/100	MACINTOSH	PS TEXT
ITC ZAPF DINGBAT/200	PS-MATH	UTF-8
ITC ZAPF DINGBAT/300	PC-858 MULTILINGUAL	ISO 4: UK
PS ITC ZAPF DINGBAT	MICROSOFT PUBLISHING	ISO 6: ASCII
ISO 8859/1 LATIN 1	PC-8 CODE PAGE 437	VENTURA INTERNATIONAL
ISO 8859/2 LATIN 2	PC-8 D/N, CP 437N	VENTURA US
ISO 8859/5 LATIN 5	PC-852 LATIN 2	VENTURA MATH
ISO 8859/10 LATIN 6	PC-851 LATIN/GREEK	WINDOWS 3.1 LATIN 1
ISO 8859/7 LT/GK E7	PC-862 LATIN/ARABIC	WINDOWS LATIN/ARABIC
ISO 8859/15 LATIN 9	PI FONT	AGFA TIDBITS
ISO 8859/7 LT/GK EG	PC-850 MULTILINGUAL (Default Setting)	WINDOWS 3.1 LATIN 2
ISO 8859/8 LATIN/HBR	PC-864 LATIN/ARABIC	WINDOWS LATIN/GREEK
ISO 8859/8 LATIN/CYR	PC-8 TK, CP 437T	WINDOWS 3.1 LATIN 5
ISO 69: FRENCH	PC-1004	WINDOWS
GREEK-8	PC-775 BALTIC	WINDOWS 3.0 LATIN 1
PC-8 GREEK	PTXT3000	WINDOWS LATIN/CYRIC
ISO 21: GERMAN	NON-UGL, PI FONT	WINDOWS 3.0 LATIN 5
HEBREW-7	ROMAN-8	
HEBREW-8	ROMAN-9	

✓ Reference the *Class Series 2 Programmer's Manual* for code page symbol set details.

DOUBLE BYTE SYMBOLS	Selects the optional ILPC code page used to print double byte fonts, where:
JIS	Japanese Industry Standard
SHIFT JIS	Shift Japanese Industry Standard
EUC	Extended UNIX Code
UNICODE	Unicode (including Korean). Default setting.
GB	Government Bureau Industry Standard; Chinese (PRC)
BIG 5	Taiwan encoded

 Reference the *Class Series 2 Programmer's Manual* for the code page symbol set details.

TIME AND DATE	Sets the printer's time and date.
MEDIA COUNTERS	Displays and controls various internal counters, where:
ABSOLUTE COUNTER	Shows the total number of inches printed and the date the counter was set (non-resettable).
PRINTHEAD COUNTER	Shows the total number of inches printed (not user-resettable).
RESETTABLE COUNTER	Shows the number of inches printed since the last reset (user-resettable).
RESET COUNTER	Returns the Resettable Counter to zero.
PRINT CONFIGURATION	Produces a Configuration Label using the printer's current database information. (To generate the label, shown here, press the RIGHT Button or the ENTER Key.)

(1) The information varies with the model, firmware version and installed options.

(2) To capture all the data, use media that is at least 2 inches (51 mm) wide and set the Label Width (in Media Settings) according to the width of your labels.

(3) Menu settings that require a reset to become effective will be indicated with a section symbol (§), while bulleted (•) items denote host changes not yet saved.

CONFIGURATION LEVEL	Displays the hardware and software levels of the printer, where: This information is also provided on the Configuration Label.
PRINTER KEY	Identifies the unique key number of the printer, in the form: `vvvv-cwxx-yyyyyy-zzz`, where: `vvvv` – Represents the printer model number. `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, and 20 = Internal CG Times Font). Features are accepted up to this value, but increases beyond the range will require an authorization code. `yyyyyy` – Is the manufacturing date code. `zzz` – Is a unique time stamp.
APPLICATION VERSION	Displays the level, version number, and date of the application firmware.
BOOT LOADER	Displays the version level and date of the boot loader.
UPGRADE PRINTER CODE	Upgrades the software feature level of the printer.
UNLOCK FEATURE	Unlocks additional optional features within the printer. (An authorization code is required.)

SET FACTORY DEFAULTS		Returns the printer settings to the factory-programmed values (except CUSTOM ADJUSTMENTS and calibrations); or, if selected, to the Factory Setting File, where selecting YES at the prompt causes the configuration to be restored.
FORMAT ATTRIBUTES		Defines the manner in which overlapping text and graphics appear when printed, where:
	TRANSPARENT	Intersecting text, images, and bar codes will be printed, for example:
	XOR	Intersecting text, images, and bar codes will not be printed, for example: (Default Setting)
	OPAQUE	Intersecting text, images, and bar codes will be printed by obliterating those formatted first, for example:
LABEL ROTATION		Allows the label format to be rotated 180 degrees before printing, where:
	ENABLED	Flips the format.
	DISABLED	Does not flip the format. (Default Setting)
IMAGING MODE		Determines the process used to format labels, where:
	MULTIPLE LABEL	Images multiple labels as memory permits to achieve the fastest throughput. If time-stamping labels, however, the indicated time will reflect the moment of imaging rather than the actual print time. (Default Setting)
	SINGLE LABEL	Images the next label only after the previous label has been printed, providing the most accurate time-stamps but at a slower throughput rate.
PAUSE MODE		Allows for controlled interactive printing, where:
	ENABLED	Requires you to press the PAUSE Key to print each label.
	DISABLED	Labels are printed without pausing. (Default Setting)
PEEL MODE		Allows the printer to wait until the Start of Print signal is received (via the optional GPIO Port) to feed a label, where:
	ENABLED	Inhibits the feed function until the Start of Print signal is received.
	DISABLED	Feeds the label regardless of the Start of Print signal. (Default Setting)
SECURITY		Allows all or part of the User Interface to be password-protected and for that password to be modified:
	SELECT SECURITY	Allows password to be set for specific User Interface areas, where:
	DISABLED	No password is required for menu access. (Default Setting)
	SECURE MENU	Sets a password requirement for User and Advanced menu entry.
	MENU AND TEST	Sets a password requirement for all menu entries.
	ADVANCED MENU	Sets a password requirement for Advanced menu entry. (After enabling this selection, make it effective by returning the Menu Mode to the User setting; see above.)
	MODIFY PASSWORD	Modifies the four-digit password required when security is enabled. For modification, the code must be reentered when prompted to confirm.

☑ To be activated, the password must initially be set to a value other than the default setting (0000).

UNITS OF MEASURE	Sets the measurement standard used, where:
IMPERIAL	Uses inches. (Default Setting)
METRIC	Uses millimeters and centimeters.
INPUT MODE	Defines the type of processing that will occur when data is received, where:
DPL	Datamax-O'Neil programming language processing will be used. (Default Setting)
LINE	Line Mode processing will be used, where data terminated by a carriage return will be extracted and inserted for template printing.
PL-Z	Alternative programming language processing will be used, with the exception of the following DPL specific-parameters: DPL Emulation; SOP Emulation; and, Label Store.
AUTO	Identifies then activates the appropriate emulation parser for the data.

☑ Correct identification can be dependant upon HOST SETTINGS / HOST TIMEOUT (see Section 4.2.5). Also, extraneous characters may, in some cases, render the data unrecognizable, thus requiring manual selection of the desired mode.

USER LABEL MODE	Sets the printer to power-up as default, where:
ENABLED	Functions in standalone mode for quick access to user defined formats; see Section 3.6. ☑ This mode will remain active until disabled.
✧DISABLED	Functions in normal mode, awaiting commands from a host.
DPL EMULATION	Allows the printer to reproduce, for backward compatibility, label formats with the same characteristics as those produced by legacy models, where:
STANDARD	Standard DPL processing will be used for printing. (Default Setting)
ALLEGRO	Processes DPL data as an Allegro®, including row position calculations based on 194 dots per inch and the exceptions noted below.
PRODIGY PLUS	Processes DPL data as a Prodigy Plus®, including column calculations based on 200 dots per inch and the exceptions noted below.
PRODIGY	Processes DPL data as a Prodigy®, including column calculations based on 200 dots per inch and the exceptions noted below.

Exceptions:
- Data Terminator processing – When printing I 2 of 5 bar codes D, J, and L, the first non-numeric character processed will terminate the bar code data field.
- Bar Size exception – When printing I 2 of 5 bar code L, if the bar size specified is greater than P (25) it is automatically decreased to 10.
- Human Readable Fonts fixed size – When printing EAN and UPC bar codes B, C, F, G, M, and N, a fixed font size is produced.
- Line and box vertical sizing anomaly – When printing rotations 2 and 4, lines and boxes are affected by the vertical multiplication factor defined in the DPL Dxx command.
- Column position defaults – Column positions greater than the printhead width are adjusted back to the printable area then printed.
- Bar codes in rotation 3 - (upside down / right to left) default sizing – When row position in rotation 3 is less than bar code height, bar codes falling off the label's leading edge are pushed back onto the label.
- <STX>L command – When no printable fields reside in the format, it results in no label movement.

COLUMN EMULATION	Allows the column dots per inch to be adjusted (153 - 203 dots), so that numbers smaller than the printhead resolution reduce the printed output from right to left, where:
XXX Dots	
ROW EMULATION	Allows the row dots per inch to be adjusted (103 - 303), so that numbers smaller than the printhead resolution enlarge the height of the printed output and numbers larger reduce it, where:
XXX Dots	
SOP EMULATION	Allows label positioning commands to function with backward compatibility when printing label formats designed for legacy models, where:
DISABLED	Produces the natural start of print position. (Default Setting)
110 (PRODPLUS)	Emulates the Prodigy Plus® start of print position.
220 (ALLEGRO)	Emulates the Allegro® start of print position.
250 (PRODIGY)	Emulates the Prodigy™ start of print position.

☑ When changing these values, the printer will automatically feed two labels to establish the new print position.

BACK AFTER PRINT		Determines media movement when a cutter, present sensor, peel and present, or GPIO is enabled, where:
	MODE	Repositions media, where:
	DISABLED	Movement occurs only when the next label is ready to print, minimizing edge curling. (Default Setting)
	ENABLED	Movement occurs according to BACKUP DELAY timing after a cut, cleared sensor, or SOP to allow fastest throughput.
	BACKUP DELAY (1/50s)	Instructs the printer to retract a presented label after a specified time elapses (0 – 255, in one-fiftieth of a second increments), where:
	000	Retraction occurs when the next label is received and processed. (Default Setting)
FONT EMULATION		Allows font substitution for all internal fonts (see examples), where:
	STANDARD FONTS	Prints using a standard (internal) font. (Default Setting)
	CG TIMES	Prints using the CG Times font.
	USER ID S50	Prints using a downloaded font.
LABEL STORE		Determines the command recall level used when retrieving stored label formats, where:
	STATE & FIELDS	Recalls the printer state (i.e., heat, speed settings, etc.) and the label-formatting commands for the stored label. (Default Setting)
	FIELDS ONLY	Recalls the label-formatting commands for the stored label.
MENU LANGUAGE		Selects the menu and configuration label language. Only languages that are resident will be displayed (see Appendix D), where:
	ENGLISH	Enables English (Default Setting)
DISPLAY SETTINGS		Determines the appearance of the items in the display, where:
	GRAPHIC DISPLAY MODE	Determines the magnification of the displayed items, where:
	STANDARD	Is the normal setting.
	ENHANCED	Is the enlarged setting.
	DISPLAY UNITS	Determines the displayed type of distance information, where:
	STANDARD	Displays the information according to the UNITS OF MEASURE setting (see above).
	IMPERIAL	Displays the information in inches.
	METRIC	Displays the information in millimeters and centimeters.

FAULT HANDLING		Determines the intervention required and the disposition of the label in process when a fault occurs, where:
	LEVEL	Selects the user action and the reprint status upon declaration of a fault, where:
	NO REPRINT	Printing stops and a fault message is displayed. Following correction of the problem, the FEED Key must be pressed to clear the fault, but the label in process is not reprinted.
	STANDARD	Printing stops and a fault message is displayed. Following correction of the problem, the FEED Key must be pressed to clear the fault then the label in process is reprinted. (Default Setting.)
	VOID AND RETRY	Depending upon the RETRY COUNT (see below), one of the following occurs: If the count has not been exceeded, VOID is printed (see VOID DISTANCE) on the failed label and reprinting automatically occurs; If the count has been exceeded, printing stops and a fault message is displayed. Following correction of the problem, the FEED Key must be pressed to clear the fault before the label in process is reprinted; or, If the CANCEL Key is pressed, reprinting is optional: to reprint press NO; or, to cancel the reprint press YES (and press YES again to cancel the batch.) ☑ (1) With no Linear Scanner attached, the printer will perform in the STANDARD setting, except that VOID will be printed on the faulted label. (2) VOID will not be printed if insufficient text space exists (see VOID DISTANCE, below), or if the fault occurred after printing. (3) The text can be customized, see the *Class Series 2 Programmer's Manual* for details.
	VOID RETRY & CONT.	VOID is printed on a faulted label, with reprint attempts occurring automatically, until the RETRY COUNT has been exceeded and then that label will be skipped (discarded) and printing will continue to the next label in queue. ☑ Linear Scanner or RFID required.
	VOID DISTANCE	Sets the distance to backup and then print VOID on a faulted label, where:
	(0.10 – 2.00 in.) 0.50	Is the distance, measured from the trailing edge of the label, which indirectly establishes the font size of the text. (The default setting is 0.5 inches.)
	RETRY COUNT	Sets the number of reprint attempts, where:
	(0 – 3) 1	Is the last label in the count to be voided before the printer will stop and display a fault message. (The default setting is one.) ☑ Retry counts greater than 1 are only valid for printers equipped with the Linear Scanner or RFID option.
	BACKFEED ON CLEAR	Determines the printer's action after a fault is cleared, where:
	ENABLED	Backup label positioning will occur after the fault is cleared.
	DISABLED	No backup label positioning will occur after fault clearing; the printer will assume that the current position is correct. (This is the default setting.) ☑ If reloading media, the label must be placed its presented position.
SCL FONT BOLD FACTOR		Sets a scalable font boldfacing amount, where:
	08 (1 – 36)	Is the setting, based on an incrementing scale, where eight (08) is nominal.

Communications

The Communications menu contains interface and host control functions:

- Serial Port A
- Parallel Port A
- NIC Adapter (Ethernet)
- Host Settings

The menu selections are defined as follows:

DISPLAYED ITEM	ITEM DESCRIPTION
SERIAL PORT A	Controls the RS-232 communications settings for Serial Port A, where:
BAUD RATE	Sets the serial communication rate, where:
(1200 – 115000 BPS) 9600 BPS	Is the range, in Bits Per Second; and, is the Default Setting.
PROTOCOL	Sets the data flow control (handshaking) method, where:
BOTH	XON/XOFF and CTS/DTR are used. (Default Setting)
SOFTWARE	XON/XOFF is used.
HARDWARE	CTS/DTR is used.
NONE	Flow control is not used.
PARITY	Sets word parity, where:
NONE	Parity is not used. (Default Setting)
ODD	Odd parity is used.
EVEN	Even parity is used.
DATA BITS	Sets word length, where:
(7 - 8) 8	A seven or eight bit word is selectable; and, is the Default Setting.
STOP BITS	Sets the number of stop bits, where:
(1 - 2) 1	One stop or two stop bits are selectable; and, is the Default Setting.
PARALLEL PORT A	Controls the communication setting for the parallel port, where:
PORT DIRECTION	Determines if data is returned from the printer, where:
UNI-DIRECTIONAL	No data is returned; communication is one-way.
BI-DIRECTIONAL	Data is returned in compliance with IEEE 1284 back-channel operation. (Default Setting) ☑ An IEEE 1284 bidirectional cable is required.
NIC ADAPTER	Controls the communications settings for the network interface, where: ☑ If a wireless card is installed, this port is automatically disabled; to enable the wired LAN connection, disable the Wireless Ethernet MODE setting (see below).
QUICK SETUP	Controls the communications settings for the network interface, where:
WIRED DHCP	Configures the card for wired connection.
WLAN UNSECURED	Configures the card for wireless connection, with SSID of "any"
WLAN ADHOC	Configures the card for wireless connection, AdHoc mode.
SET FACTORY DEFAULTS	Resets NIC Adapter parameters to the factory defaults values.

WLAN		Controls the communications settings for the network interface, where:
	MODE		Selects between wired and wireless operation, where:
		ENABLED	Enables the wireless interface. (This is the Default Setting.)
		DISABLED	Enables the wired interface.
	BSS ADDRESS		Specifies the radio module's static IP address; up to four octets separated by a period. If Enable DHCP is *checked*, this parameter is ignored. Default is 0.0.0.0.
	SIGNAL READINGS		Provides a graphical representation of Signal Strength (in dBm), Noise Level (in dBm), and Quality.
IP ADDRESS		Specifies the static IP Address of the interface in the standard octet format.
SUBNET MASK		Specifies the static Subnet assigned to the interface, for example: 255.255.255.000.
GATEWAY		Specifies the Gateway Address the interface will use, for example: 010.001.001.001.
SNMP TRAP DESTINATION		Specifies the network IP Address where SNMP traps will be sent when SNMP service is installed on your receiver. If zeroed, no traps are sent.
IP DISCOVERY		Sets the address discovery method, where:
	ENABLED		The card broadcasts over the network to receive addresses from the responsible server at startup. Manual modifications to IP Address, Subnet Mask, or Gateway Address are not allowed; and, if no server is found, the specified static value will be used. (Default Setting) ☑ A server assigned IP address takes precedence over any static IP address stored in the interface.
	DISABLED		The stored static IP, Subnet Mask, and / or Gateway Address will be used.
SNMP		Sets SNMP
	ENABLED		(Default Setting)
	DISABLED		
ADVANCED		Advanced settings for the NIC Card.
	TELNET		Enable/Disable Telnet protocol
	FTP		Enable/Disable FTP protocol
	MTU		Sets the Maximum Transmission Unit packet size, where: Packet size, in bytes. (512-65515); Default is 1500
	GRATUITOUS ARP		Sets time interval for ARP transmission packets, where: (0-2048 minutes); Default is 0
	TCP KEEPALIVE		Allows monitoring of an open connection to detect any disconnects not properly closed, including reset access points and unplugged printers, where:
		ENABLED	Keeps monitoring active.
		DISABLED	Closes such a disconnection after 2.5 minutes. (Default Setting)
	PORT NUMBER		Selects the Port to use for all network communications; Default is 9100
	DUPLEX CAPABILTY		Specifies the transmission and speed of the wired Ethernet connection: • Auto-Negotiate (default); • 100 BaseT Full Duplex; • 100 BaseT Half Duplex; • 10 BaseT Full Duplex; or, • 10 BaseT Half Duplex
	ADVERTISE CAPABILITY		Selects the method in which the Duplex Capability setting is advertised, where: • Automatic (advertises the DUPLEX CAPABILITY setting); or, • All Capabilities (advertises all capabilities)
NETWORK REPORT		Prints or displays a report which lists the printer's network settings.
SET FACTORY DEFAULTS		Resets NIC Adapter parameters to the factory defaults values.

HOST SETTINGS	Controls the communications with a host device, where:	
		The "ignore host" settings for ESC SEQUENCES, HEAT, SPEED, TOF SENSING, SYMBOL SET, CNTRL-CODES, STX-V SW SETTINGS, and MAX LENGTH will be unaffected when PL-Z Mode is selected (see Input Mode for details).
HOST TIMEOUT	Sets the number of seconds (1 - 60) that an established communications port must be idle before data can be received through an alternate port, where:	
		If the time-out period is exceeded before all data is received, the data will be ignored.
10	Is the Default Setting.	
CONTROL CODES	Allows changes to the prefix of the software commands interpreted by the printer, where:	
STANDARD CODES	Use these characters: Hex 01 = SOH command; Hex 02 = STX command; count-by = ^; Hex 1B = ESC; Hex 0x0D = Carriage Return. (Default Setting)	
ALTERNATE CODES	Use these characters: Hex 5E = SOH command; Hex 7E = STX command; count-by = @; Hex 1B = ESC; Hex 0x0D = Carriage Return.	
ALTERNATE CODES 2	Use these characters: 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.	
FEEDBACK CHARACTERS	Allows the printer to return a Hex 1E (RS) after each label successfully prints, and a Hex 1F (US) after each label batch successfully prints, where:	
ENABLED	Sends feedback characters to the host.	
DISABLED	Does not send feedback characters to the host. (Default Setting)	
ESC SEQUENCES	Allows data containing invalid ESC control code sequences to be processed, where:	
ENABLED	Processes commands normally. (Default Setting)	
DISABLED	Ignores ESC sequences are during processing (since some systems send a "banner" to the printer). Bitmapped font downloads are disabled in this mode.	
HEAT COMMAND	Determines the way the DPL Heat command is handled, where:	
ENABLED	Processes commands normally. (Default Setting)	
DISABLED	Ignores DPL Heat commands; instead, the heat value is controlled via the menu setting.	
SPEED COMMANDS	Determines the way DPL Print, Feed, Slew, and Reverse commands are handled, where:	
ENABLED	Processes commands normally. (Default Setting)	
DISABLED	Ignores DPL speed commands; instead, the speeds are controlled via the menu setting.	
TOF SENSING COMMANDS	Determines the way in which DPL Gap, Continuous, and Reflective commands are handled, where:	
ENABLED	Processes commands normally. (Default Setting)	
DISABLED	Ignores DPL TOF commands; instead, TOF is controlled via the menu setting.	
SYMBOL SET COMMAND	Determines the way in which DPL Single and Double Symbol Set commands are handled, where:	
ENABLED	Processes commands normally. (Default Setting)	
DISABLED	Ignores DPL Symbol Set commands; instead, the Symbol Set selection is controlled via the menu setting.	
CNTRL-CODES (DATA)	Determines the way in which DPL SOH, STX, CR, ESC, and ^ codes are handled, where:	
ENABLED	Processes commands normally. (Default Setting)	
DISABLED	Ignores DPL Control Codes; instead, the control code functions are established via the menu setting.	

STX-V SW SETTINGS	Determines the way in which the DPL <STX>V command is handled, where:
ENABLED	Processes commands normally. (Default Setting)
DISABLED	Ignores the option-enable command; instead, the option selections are controlled via menu settings.
MAX LENGTH COMMAND	Determines the way in which the DPL <STX>M command is handled, where:
ENABLED	Processes commands normally. (Default Setting)
DISABLED	Ignores the maximum label length command; instead, Maximum Label Length is controlled via the menu setting.
OPTION FEEDBACK	Allows feedback characters from an optional device to be returned to the host device, in the format of: `<A;B;C;D;E;F>[CR]` Where: <table><tr><td>A -</td><td>Is the device type: R = RFID; and, S = Linear Scanner</td></tr><tr><td>B -</td><td>Is the resulting status: C = entire label complete; F = faulted (failed) label; and, U = unknown</td></tr><tr><td>C -</td><td>Is the number of expected reads, given in two characters.</td></tr><tr><td>D -</td><td>Is the number of good reads, given in two characters.</td></tr><tr><td>E -</td><td>Is the internal Job and Sub Job Identifier, given in four characters each.</td></tr><tr><td>F -</td><td>Is the data that was read, delimited with semicolons (;) on multiple reads.</td></tr></table>
DISABLED	No data is reported. (Default Setting)
SCANNER	Linear Scanner information is reported.
RFID HEX	RFID information is reported in hexadecimal format.
RFID ASCII	RFID information is reported in an ASCII format.
PROCESS SOH (DATA)	Determines the way the printer responds to an Immediate Command (e.g., Get Status, Module Storage, etc.), where:
ENABLED	Operations are interrupted upon receipt to process the command.
DISABLED	Processes commands normally. (Default Setting)

Diagnostics

The Diagnostics menu contains testing functions and printhead reporting selections:

- Hex Dump Mode
- Options Testing
- Print Test Rate (min)
- Sensor Readings
- Ribbon Sensor Limits
- iPH Report
- Icon Descriptions

The menu selections are defined as follows:

DISPLAYED ITEM	ITEM DESCRIPTION
HEX DUMP MODE	Determines how the printer handles the data received from a host, where:
ENABLE	The printer outputs the raw ASCII data it receives without interpretation; no processing occurs.
DISABLE	Processes data normally. (Default Setting)
FILE CAPTURE	Saves the incoming data to Module H (USB thumbdrive) if present; otherwise, the file is stored on Module G. The file name, in the form [dmx_xxx_yyy.dpl], where the count is automatically incremented for every capture and a unique printer time stamp (xxx), is assigned.
OPTIONS TESTING	Performs printer option diagnostics or monitors and outputs test results, where:
TEST PRESENT SENSOR	Performs a functional test of the Present Sensor by indicating LABEL PRESENTED (when a label blocks the sensor) and LABEL NOT PRESENTED (when no label blocks the sensor). (Note that this test can also be used to check the sensor function of the Peel & Present option.)
TEST CUTTER	Performs a functional test of the Cutter, where:
PERFORM TEST 001 TIMES	Cycles the cutter blade a selected number of times (0 - 999), with PASS / FAIL results given for each cycling attempt.
TEST GPIO	Performs a functional test of the GPIO port, where:
MONITOR GPIO INPUT	Displays input signal logic values for Start of Print (SOP). ☑ If unconnected, a zero or one may be displayed.
TEST GPIO OUTPUT	Displays output signal logic values for End of Print (EP) and Service Required (SR). ☑ To change an output signal state, cursor over the displayed state to select and then toggle it using the UP or Down Arrow Buttons.
PRINT SIGNAL INFO	Prints a reference label containing GPIO signal names, pin assignments, programmed settings, and current signal states.
TEST RFID	Performs a functional test of the RFID option, where:
TAG DATA	Reads the data encoded on the RFID chip.
DEVICE VERSION	Displays the type and version of the encoding device.
TAG ID - HF ONLY	Reads and displays the High Frequency Tag ID number.
PRINT TEST RATE (MIN)	Sets a label-to-label delay interval (0 - 120 minutes) when Test label batch printing, where:
000	Is the Default Setting.

SENSOR READINGS	Displays the values (0 – 255) from the printer sensors, where:
	THR TRAN RIBM 24V 103 091 009 171 PS HD RANK 003 255 050 THR = Printhead thermistor sensor; TRAN = Gap media sensor (REFL when set to reflective); RIBM = Ribbon sensor; 24V = 24 volt power supply sensor; PS = Present sensor; HD = Printhead position sensor; and, RANK = Printhead ranking resistor.
RIBBON SENSOR LIMITS	Displays the values from the ribbon sensor readings (see example below) for printers equipped with the thermal transfer option, where: RIBBON ADC LOW 111 RIBBON ADC HIGH 249
iPH REPORT	Displays the IntelliSEAQ™ printhead report data, where:
VIEW	Displays the data.
PRINT	Prints a reference label: iPH REPORT TUE 12:44PM 23MAY2006 4212-HE25-060224-090 PRINTHEAD SERIAL #: 5x-00289 PRINTHEAD MODEL # 163 PRINTER SERIAL # 60430014 PRINTHEAD INCHES 11175 INSTALLATION DATE - INITIAL 02/02/2006 INSTALLATION DATE - LAST 28/ 02/2006 PRINTHEAD CLEANING CLEAN PROCEDURES: 0 CLEAN COUNTER RESET 0 NUMBER OF INCHES - INITIAL 0
ICON DESCRIPTIONS	Displays the various printer icon assignments, listed by group: • System Icons • Network Icons • Input Type Icons • Option Icons

MCL Options

The MCL Options menu contains MCL starting options:

- MCL at Power-UP
- Start MCL

The menu selections are defined as follows:

DISPLAYED ITEM	ITEM DESCRIPTION
MCL AT POWER-UP	Determines if MCL should be started at printer power-up.
ENABLE	Starts MCL at power-up of printer
DISABLE	Does not start MCL
START MCL	Immediately starts MCL

5 Maintenance and Adjustments

5.1 Cleaning Intervals

This section details the cleaning, adjusting, and troubleshooting tips for the printer. The following table outlines the recommended maintenance schedule for the various printer parts.

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

* It is recommended that a solvent containing isopropyl alcohol be used.

⚠ Isopropyl alcohol is a flammable solvent; always take the proper precautions when using this substance.

Proper cleaning is critical. To maintain peak performance of the printer, Datamax-O'Neil offers a complete line of cleaning products including pens, cards, films and swabs. Visit our website at http://www.datamax-oneil.com to learn more.

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5.2 Cleaning the Printhead

If print quality declines (symptoms include non-compliant bar codes, print dropouts, and streaks; see sample label below), the typical cause is debris build-up on the printhead. Furthermore, when the build-up is not removed it may lead to element failure, greatly reducing the service life of the printhead.
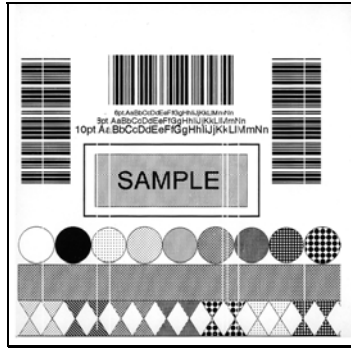

Faulty Print Quality Label:

Streaks indicate a dirty or faulty printhead.

To clean the printhead:

1. Turn 'Off' and unplug the printer.

2. Open the cover. Unlock the Printhead Latch and raise the Printhead Assembly. **Allow the printhead to cool before proceeding.**

3. Move media and ribbon away from the printhead as necessary.

4. Using a Cotton Swab moistened, not soaked, with isopropyl alcohol gently wipe away any build-up on the printhead surface, paying close attention to the Burn Line. Allow the printhead to dry.

5. Replace the ribbon and media. Lower the Printhead Assembly back to the locked position.

6. Close the cover. Plug in and turn 'On' the printer. Feed several labels to normalize tracking.
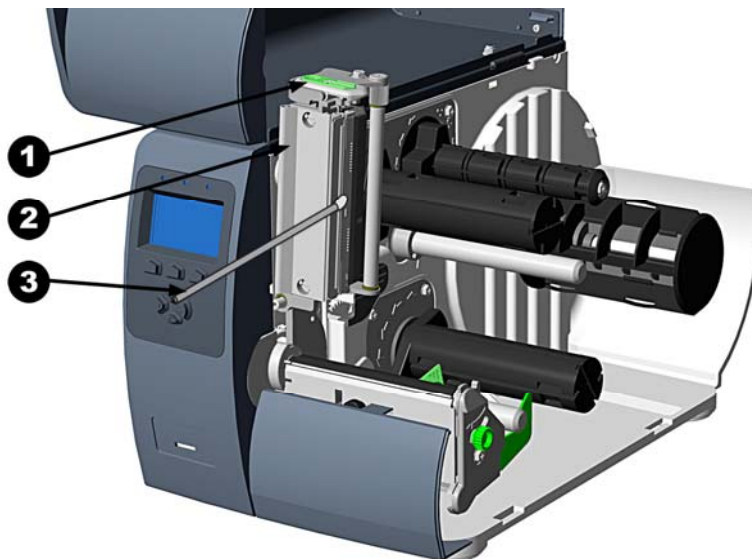
❶	Printhead Latch
❷	Printhead Assembly
❸	Cotton Swab

Automated Printhead Cleaning (Display-equipped printers, only)

1. Remove media and ribbon.

2. Place a Datamax-O'Neil Cleaning Card, part number 70-2013-01 under the printhead. Lower and lock the printhead. Ensure that the Media Width Adjustment is <u>not</u> engaged.

3. Press and hold the TEST Key for approximately four seconds.

   The printer will begin the cleaning routine.

4. In cases of heavy build-up, or if high heat values are typically used for printing, flip the card over and repeat Step 3.

5. Reinstall your ribbon and media (if necessary, readjust the Media Width Adjustment, see Section 5.3). Lower and lock the printhead. Close the cover.

5.3 Media Width Adjustment

When printing on less than full width media, adjust for even pressure distribution, as follows:

1. With media loaded in the printer, print a label and examine it.

   Non-display printers:
   Simultaneously press the Ⓥ PAUSE + ⊗ FEED buttons

   Display-equipped printers:
   See Section 4.4

2. While observing the printed labels, loosen the Thumbscrew 1/4 turn. This keeps enough tension on the screw preventing the thumbscrew from slipping from the desired position while still allowing for adjustment. Slide the thumbscrew to the left most position, (see Example 1, below).

3. Next, move the Thumbscrew to the right for each printed test label until the labels contain a complete, even image (see Example 2). Tighten the Thumbscrew.
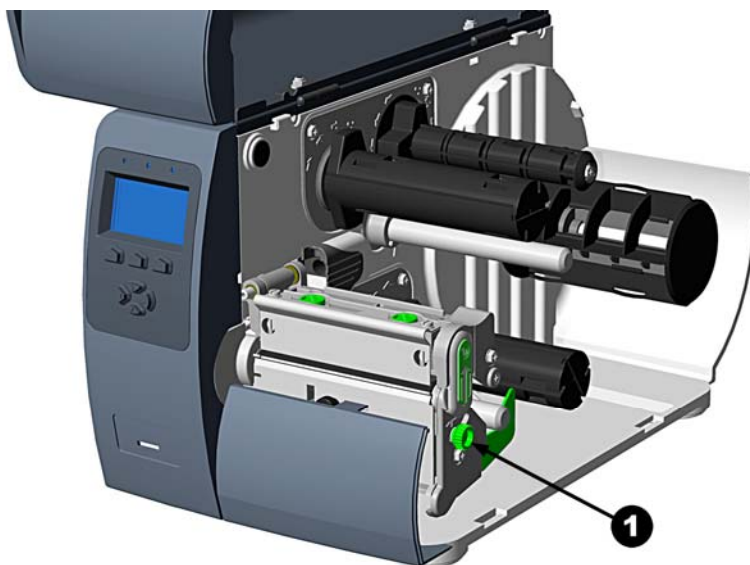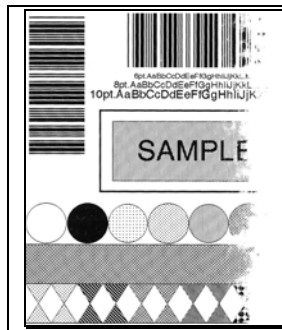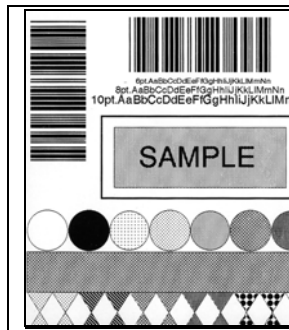

❶ Thumbscrew

Example 1 – Over adjustment:

Too much adjustment produces an image that fades across the label. To correct this, move the Thumbscrew to the right.

Example 2 – Correct adjustment:

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

> ☑ Under-adjustment can also cause problems including ribbon wrinkling, label tracking, and platen roller and printhead wear. When changing to a different width of label, always perform this adjustment.

5.4 Printhead Burn Line Adjustment

The Burn Line has been adjusted for strict compliance using 6.5-mil (.0065 inch) media, ensuring print quality across a majority of media types. In extreme cases, however, if media of a different thickness or rigidity is used (for example, heavy tag stock) the print quality can change.

> ☑ If you have questions, contact a qualified technician or Datamax-O'Neil Technical Support before proceeding.

To adjust the Burn Line:

1. Load the printer with your media (and ribbon, if required).

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

3. Turn the Adjustment Screws counter-clockwise until the burn line is past the platen roller vertex. Print a test label; the label should look light and uneven.

   Non-display printers:
   Simultaneously press the 🅥 PAUSE + ⛒ FEED buttons

   ***Display-equipped printers:***
   See Section 4.4

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

5. Turn <u>each</u> Adjustment Screw clockwise about a ¼ turn (or 1/8 turn for finer adjustments, see note below). Print another test label and examine the print quality. Repeat this step until labels are produced with even print contrast and acceptable print quality.

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

6. Tighten the Locking Screws then print a final test label to verify the adjustment.
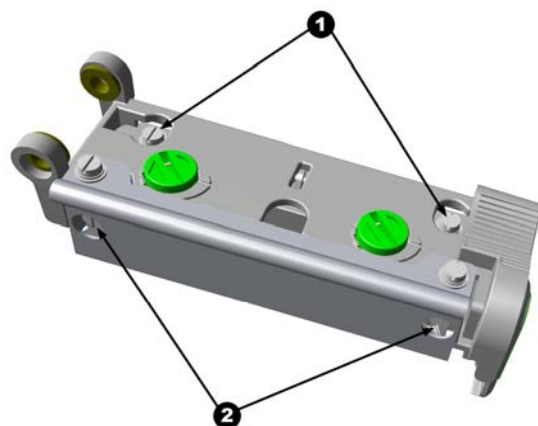
| ❶ | Locking Screws |
| ❷ | Adjustment Screws |

5.5 Printhead Pressure Adjustment

To accommodate a variety of media types, printhead pressure is adjustable. This pressure is factory set to work with most media types, so this adjustment should only be performed after attempting to improve print quality through the use of the (1) heat and/or (2) print speed. When adjusting, use only the minimum pressure necessary for better imaging. To adjust:

1. Load at least 4" (102mm) wide media and ribbon, see Section 2.2.

2. Ensure the Media Width Adjustment is set to its "left most" position, see Section 5.3.
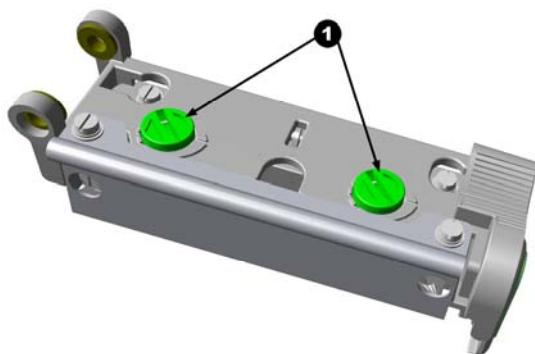
3. Print a test label.

    Non-display printers:
    Simultaneously press the Ⓥ PAUSE + ⬌⦵ FEED buttons

    Display-equipped printers:
    See Section 4.4

4. Turn the Pressure Adjustment Cams counterclockwise to increase the applied pressure or clockwise to decrease it. Make <u>equal</u> adjustments to each cam to achieve even print contrast across the media.

| ❶ | Pressure Adjustment Cams |

☑ When using narrow media it is sometimes necessary to increase the pressure on the inner (closest to centerplate) Pressure Adjustment Cam to prevent ribbon smudging.

Excessive pressure can reduce the service life of the printhead and platen roller, while unequal pressure may cause ribbon and label tracking problems.
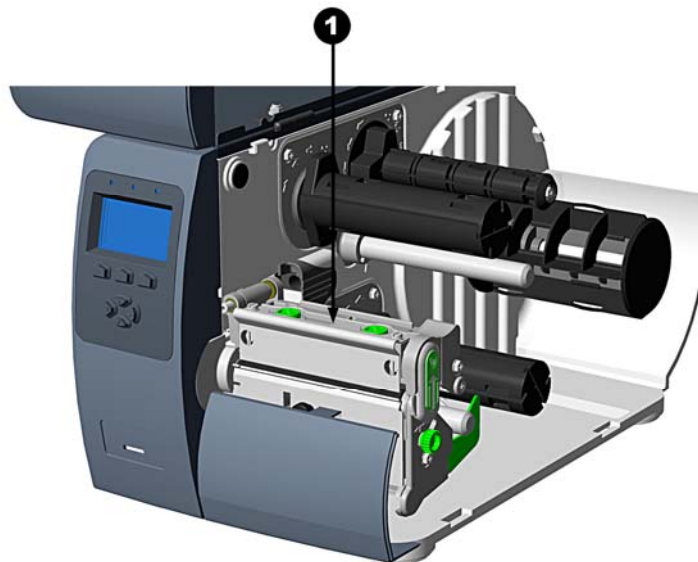
5.6 Printhead Replacement

To replace a damaged printhead, follow the procedure below.

☑ Printheads are fragile; use extreme care when handling and never use a sharp object on the surface. If you have questions, contact a qualified technician or Datamax-O'Neil Technical Support before proceeding.

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

2. Turn 'Off' and unplug the printer. Open the cover; if ribbon is installed, remove it.

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

4. Unlatch the Printhead Assembly. While holding the Printhead, raise the assembly. Disconnect the two cables and then remove the old Printhead.

5. While carefully holding the new Printhead, connect both cables.

6. Position the Printhead onto the Locating Pins in the Printhead Assembly and secure in place with the Printhead Mounting Screw (do not over-tighten).

7. Clean the Printhead (see Section 5.2).

8. Reload ribbon (if removed), lower the printhead assembly, and rotate the printhead latch back, into the locked position.

9. Use the Darkness Adjustment to match the print contrast of the new printhead to that of the old printhead see Section 5.7.

❶ Printhead Mounting Screw

5.7 Darkness Adjustment

Non-display printers: The Darkness Adjustment allows the operator to match the print contrast following a printhead replacement. Turning the Darkness Adjustment clockwise will darken the print, while turning it counterclockwise will lighten the print. Compare a label printed with the old printhead and make this adjustment so that the new printhead matches the darkest portion of that label.

Display-equipped printers: Use the printer's menu to adjust Darkness; see Section 4.5, Print Control / Custom Adjustments.

❶   Darkness Adjustment
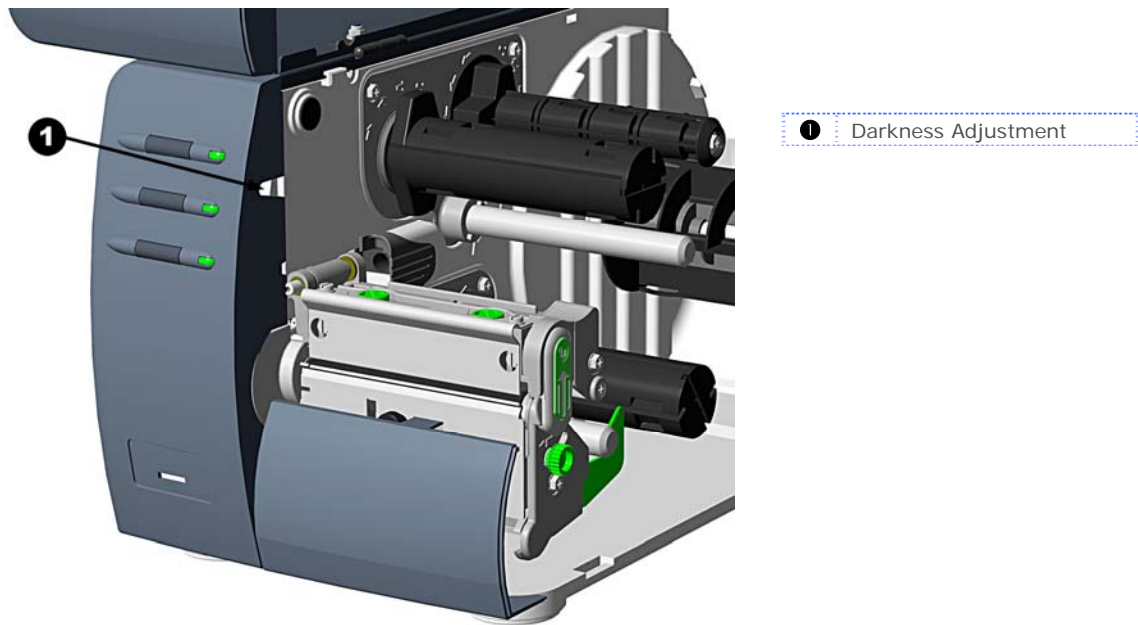
☑   Large increases in the 'Darkness Adjustment' can shorten printhead life. If you need to increase the darkness of the printed labels, try increasing the Heat value and/or slow the Print Speed using your software program or via DPL commands

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5.8 Resetting the Printer

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

Soft Reset - To reset the printer and clear any temporary host settings:

1. With the printer 'On', press and hold the **PAUSE** and **CANCEL** buttons for approximately four seconds.

Level One Reset - To return the printer to the factory default settings or, if saved, to restore the Factory Setting File:

1. Turn 'Off' the printer.

2. Turn on the printer, when the three lights turn on press and hold the PAUSE and CANCEL Keys; continue to depress the keys until the 'READY' message or Ready light appears.

> ☑ This reset has the same effect as the System Settings / Set Factory Defaults selection in the menu system.

Level Two Reset - To return the printer to the firmware default settings, and clear all the calibration and adjustment parameters:

1. Turn 'Off' the printer.

2. Turn on the printer, when the three lights turn on press and hold the PAUSE, FEED, and CANCEL Keys; continue to depress the keys until the 'READY' message or Ready light appears.

> ☑ After executing a Level 2 Reset, the media calibration must be performed; see Section 3.5.

5.9 Downloading Firmware and Fonts

The operating programs and fonts for the printer are stored in Flash memory on the Main PCB. When program updates and/or new features are added, they can be downloaded to the printer as follows:

1. Identify the new version for your model of printer from the Datamax-O'Neil Web site at www.datamax-oneil.com and download it onto your computer's hard drive or a floppy disk.

2. Ensure that the printer is connected to the host, (via parallel port only) and that the power is 'On.' Using the DOS copy command, enter:

    copy filename.dlf lpt1/b   (non-display printer firmware is .dlf extension)

☑ Other programs (e.g., hyper-terminal and certain Windows® Driver programs) may also be used to download this file.

3. The READY ⏻ light will flash during the download.

4. ***Following a successful download***, the ⊽ STOP Light will illuminate then the printer will perform a 'cold reset.' The previous printer setup will not be affected unless substantial firmware data structure changes have occurred. Print a Database Configuration Label to verify your new firmware version.

    Following an unsuccessful download, the ⊘ ERROR Light will illuminate then the printer will perform a 'warm reset' (both the READY ⏻ and ⊽ STOP lights will be on during power-up initialization). The original firmware will remain operational. If the printer fails to reset, toggle the power 'Off' and 'On.'

    Try re-sending the file to the printer. If the failure continues, check the following possible causes:

    - An invalid or corrupted file is being downloaded - Ensure the file being downloaded is correct and applicable for your printer model.

    - Possible communications error - Check the cable connection between the host and printer and ensure that a quality, shielded cable is used.

    - Possible Flash memory problem - Call for service.

Processing TrueType Fonts *(Display-equipped printers with SDIO/USB Host)*

To process TrueType fonts (.TTF) on an external module for use by the printer:

1. Use Windows Explorer to download the font to a module.

2. Install the module in the printer.

3. Press the **MENU** button then select **Printer Options**.

4. Select **Modules** and then **Process File**.

5. Select the module ID and the font file.

6. When prompted enter a 2 character font ID, and then the destination module ID.

7. Ensure that your label formats use the same font ID as assigned in Step 5.

Copying TrueType Fonts *(Display-equipped printers with SDIO/USB Host)*

To copy TrueType fonts (.TTF) to an external module for use by the printer:

1. Use Windows Explorer to download the font to the module.

2. Add a 2 digit DPL font ID to the file name (50-99, 9A-9Z, 9a-9z) then change the file extension to .dtf (for example, arial50.dtf); see Scalable Font Downloading in the *Class Series 2 Programmer's Manual*.

3. Install the module in the printer.

4. Ensure that your label formats use the same font ID as assigned in Step 2.

Removing Fonts *(Display-equipped printers)*

When deleting a plug-in, all files contained within that directory will also be deleted; see Section 4.5, PRINTER OPTIONS / MODULES / DELETE FILE for details.

5.10   File Handling Messages (Display-Equipped Models)

Depending upon the module and operation selected, several messages are possible when using the file handling system:

File Handling Messages		
Displayed Message	**Description**	**Possible Solution(s)**
FAILED	The copy or format request has failed.	Insufficient space exists to store the file or the module is protected - try storing to a different location. (If the problem persists, this could indicate a hardware problem.)
FILE EXISTS, OVERWRITE?	An existing file of the same name and type was found.	Select YES to overwrite or NO to exit.
MODULE PROTECTED	Formatting has been denied because the module is protected.	Unprotect the module.

File Handling Messages (Continued)		
Displayed Message	Description	Possible Solution(s)
NO FILES AVAILABLE	No associated files can be found to perform the requested action.	Ensure the file is present: • Following a Print File request, this is normal when no files are available for printing (also note that some files will print only the file name); • Following a Process File request, this is normal when no files are available for processing (also note that some files may not display); or, • Following a Copy File request, this is normal when no files are available for copying (also note that internal database files cannot by copied).
NOT SUPPORTED	The file type requested is not supported.	Recheck the type of file requested for printing or processing, and ensure that it matches one of the available types for that function.
PROTECTED, COPY FILE?	The file requested will be copied to a protected module.	Select YES to override protection and copy the file, or NO to exit.
UNFORMATTED	The module is unformatted.	Format the module. ![Warning] *FORMAT MODULE will erase all data in the selected memory.*

6 Troubleshooting

6.1 Problem Resolution

Should a problem arise, the information in this section will help you resolve it. The following table lists problems that may not necessarily generate an error condition. Items denoted with an asterisk (*) are only for display-equipped printers.

If experiencing this problem...	Try this solution...
Can not communicate through the parallel port:	Observe the Ready Indicator as the format is sent to the printer. If it does not flash, check the parallel cable type. Also, check the protocol and port settings between the printer and host.
Can not load media through the optional cutter:	**WARNING!** *Use extreme care. Turn 'Off' and unplug the printer before proceeding.* Ensure that the cutter is properly installed. Plug in and turn 'On' the printer. You should hear the cutter blade rotate and position itself properly. However, if the problem continues call for service.
* The LCD is blank, but the Ready Indicator is 'On':	The display contrast may set too low. Press and hold the MENU Key for 10 seconds or until the display reappears.
Erratic feeding:	The printer may require Calibration; see Section 3.5.
Erratic printing (instead of the label format, strange characters are printed):	• The printer may be in Hex Dump Mode; see Section 6.3. • If using the serial port for communicating, check both 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).
Intellifont™ will not print:	Intellifont™ format is Little/Big Endian specific. The printer uses Big Endian. Refer to your font supplier for information.
Light print on the right side (facing the printer) of the label:	• The Media Width Adjustment may be incorrectly adjusted; see Section 5.3. • The Printhead or Platen Roller may be dirty or worn; clean or call for service.

If experiencing this problem...	Try this solution...
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. • The available memory may have been exceeded by the memory requirement of the label format. Try reducing the memory allocated to either the internal module or scaleable font caches (non-display printers, see Section 3.4; display-equipped printers, see Section 4.5.) • If using serial communications, ensure that the interface cable meets the requirements found in Section 2.1.
Missing print on left or right side of the label:	Information may be formatted outside the label dimensions. Check your software program label size. For display-equipped printers also check the values in the menu for Print Control / Column Offset and Print Control / Custom Adjustments / Column Offset; see Section 4.5.
No power (all indicator lights are 'Off"):	• Verify that the AC power cord connection has been made at both the outlet and the printer; also, ensure the power switch is 'On'. • Verify that the AC outlet is functioning, or try moving the printer to another AC circuit. • The AC cord may be damaged; replace it. • The line fuse may be blown; call for service.

If experiencing this problem...	Try this solution...
Nothing is printing (labels advance normally, but no image is printed):	Examine the used ribbon for an image: **If there is an image on the used ribbon:** • Verify that the ribbon was properly loaded per Section 2.4. • If properly loaded, the wrong coating configuration was used. (To verify the inked side, press the adhesive backing of a label against the ribbon surface. Ink will only lift from the coated side of the ribbon.) Clean the printhead (see Section 5.2); then replace the ribbon with the correct type for the printer, Section 2.4. **If there is no image on the used ribbon:** • Print any Internal Test Label (non-display printers, see Section 3.1.2; display-equipped printers, 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 may be too low. Make an adjustment in the software program or through the Front Panel. • The media/ribbon combination may be incorrect. Contact a Media Representative. • The printhead or printhead cable(s) may be loose; power 'Off' the printer then reconnect.
Nothing happens when trying to print using a software program:	• Ensure that the printer is at READY. • Observe the Front Panel, if the READY light does not flash as you send the format check the protocol and port settings between the printer and host. • Ensure the interface cable meets the requirements found in Section 2.1.

If experiencing this problem...	Try this solution...
Poor print quality:	• The printhead may need cleaning; see Section 5.2. • Adjust the Heat and Print Speed settings through the Front Panel or by host commands (non-display printers, see Section 3.4; display-equipped printers, see Section 4.5.) • The media/ribbon combination may not be compatible; contact a Media Representative. • The Media Width Adjustment may be incorrectly adjusted; see Section 5.3. • The Platen Roller may be dirty or worn; clean or call for service. • The Printhead Burn Line may need adjusting; see Section 5.4.
Skips labels when printing:	• Media Calibration may be needed; see Section 3.5. • The Media Sensor may be out of position; readjust the position; see Section 2.3. • The format may be within 1/8 inch of the label's trailing edge. Try reducing or moving the format slightly.
Unable to print rotated text:	The characters may be formatted outside the label dimensions. Ensure the row/column values provide enough room for the height of the characters or bar code to be printed. See the *Class Series 2 Programmer's Manual* for details.

6.2 Fault and Warning Messages (Display-equipped printers)

All printer functions are internally monitored. If a problem (Fault) or a potential problem (Warning) is detected, the Error Indicator will be illuminated. A corresponding message will be displayed. 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 toggle between messages.

☑	To return to normal operation after the printer enters a fault condition, the fault must be corrected and then the FEED Key must be pressed to clear the condition.

Printer Fault Messages		
Displayed 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.
CUTTER FAULT	The printer has detected a cutter mechanism fault.	**WARNING!** Use extreme care. Turn 'Off' and unplug the printer before proceeding. Examine the cutter for obstructions and ensure that the cutter cable is properly installed. Plug in and turn 'On' the printer. Press the FEED Key. If the fault does not clear, call for service.
DMA FAULT	The printer has detected a Direct Memory Access failure.	Try cycling the printer power 'Off' and 'On'. If the fault does not clear, call for service.
GAP MODE CANNOT CALIBRATE	Consistently low sensor readings were detected.	Press any key to continue. Ensure that media was inserted in the 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 3.5.

Printer Fault Messages (continued)		
Displayed 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.
```OUT OF STOCK```	The printer can not 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 2.3. 4) If using media with large gaps, adjust the Paper Empty Distance. 5) Calibrate the printer; see Section 3.5.
```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 related fault condition; or (2) if necessary, calibrate the printer; see Section 3.5.
```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.

Printer Fault Messages (continued)		
Displayed Message	**Description**	**Possible Solution(s)**
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.
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 loaded and that the printhead assembly is latched. 2) Check the ribbon supply and ribbon take up hubs for obstructions that may be stopping movement. 3) Ensure that the ribbon core fits snugly on the ribbon supply hub. 4) Ensure that the media and paper combination is not slipping (usually caused by an incorrect match).
TEMPERATURE FAULT	The printer has shutdown to allow the printhead temperature to cool.	Turn 'Off' the printer until cool to prevent permanent damage due to an excessive printhead temperature.

	Printer Fault Messages (continued)	
Displayed 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.<br><br>☑ *When the printer is set for reflective media, this fault is given for an out of stock condition.* | **If media is moving:**<br><br>1) Press the FEED Key. It may be necessary to re-calibrate the printer; see Section 3.5.<br><br>2) The Media Sensor may be out of position. Readjust it; see Section 2.3.<br><br>3) The media may not be properly loaded. Reload media, also ensure that the Media Guide is positioned properly; see Section 2.2.<br><br>4) The Media Width Adjustment may be improperly adjusted; see Section 5.3.<br><br>5) The label may be longer than the default value for maximum length. Check the Media Settings / Maximum Label Length; see Section 4.5.<br><br>6) The Media Sensor may be obstructed. Check and carefully remove any obstruction (labels, paper dust, adhesive, etc).<br><br>**If media is not moving:**<br><br>The printhead assembly may not be latched. |

Warning Messages:

Warning Messages are displayed for a period of five seconds. If multiple warnings are detected, the display will reflect the highest priority message.

Printer Warning Messages		
Displayed Message	**Description**	**Action(s)**
`DOT FAILURE`	The printer has detected defective printhead elements.	Replace the printhead if the print quality becomes unacceptable.
`GAP MODE` `WARNING LOW BACKING`	The printer measured only a small difference between the 'empty' and 'gap' sensor readings.	Transparent backing or notched media typically gives this indication. 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.
`HOST CHANGES PENDING`	The host has pending configuration changes that will not take effect until a 'host reset command' is issued.	To save changes, send a host reset command (in DPL); or to discard changes.
`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.
`RTC RAM FAILURE`	The printer was unable to save settings in permanent memory.	Possible faulty Main PCB. If the condition persists, call for service.
`IP DISCOVER FAILED`	The printer was unable to find a DHCP server.	This message does not effect the operation of the printer and can be cleared from the display by pressing the ⊹ FEED button. To stop this from reoccurring be sure the menu item 'IP DISCOVERY' is set to 'DISABLED', see Section 4.5.
`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 2 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 print the Hex Dump Label:

Non-display printers: With the printer loaded with media (at least 4 inches wide) and ribbon (if printing with thermal transfer media). Turn on the printer, when all three lights turn on press and hold the ⬦ FEED button. Continue holding the ⬦ FEED button until the ⊘ STOP light turns off. Now, all data received by the printer will be output in hexadecimal code, along with the printable ASCII equivalents, as shown below. To exit Hex Dump Mode, simply turn the printer off and then back on.

Display-equipped printers: To begin, go to the Diagnostics menu and enable Hex Dump Mode; see Section 4.5. 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, as shown below. To exit Hex Dump Mode, re-enter the Diagnostics Menu and disable the Hex Dump Mode, exit the menu, then save the changes.

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-O'Neil Technical Support with any questions.

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

A Specifications

Mechanical

Width	9.8″ (24.9 cm)
Depth	18.06″ (45.9 cm)
Height	10.3″ (26.2 cm)
Weight	27.0 lbs. (12.2 kg)
Operating Temperature	40° F to 95° F (4° C to 35° C)
Humidity	10% – 95% non-condensing
AC Input Voltage	90 – 132 or 180 – 264 VAC @ 47–63 Hz, auto-ranging.

Printing

Print Method	Direct Thermal; Thermal Transfer (optional)
Print Speed	2 - 6 IPS (50 - 152 mm/s) *M-4206 & M-4306* 2 - 10 IPS (50 - 254 mm/s) *M-4210*
Resolution	203 dpi (8 dots/mm) *M-4206 & M-4210* 300 dpi (11.8 dots/mm) *M-4306*
Tear Bar	Tear Down
DRAM Memory	8MB *M-4206* 16MB *M-4210 & M-4306*
FLASH Memory	4MB *M-4206* 8MB *M-4210 & M-4306*

Media/Ribbon

Media Types	Roll-Fed, Die-Cut, Continuous, Fan-Fold
Max. Media Width	4.65" (118 mm)
Min. Media Width	1.0" (25 mm)
Max. Print Width	4.25″ (108 mm) *M-4206 & M-4210* 4.16″ (105.7mm) *M-4306*
Print Length Range	.25 - 99" (6 - 2475 mm)
Media Thickness Range	.0025 - .01" (.064 mm - .254 mm)
Media Supply Roll Capacity	8" (203 mm) O.D. on a 3.0" (76.2 mm) core 7" (178mm) O.D. on a 1.5″ (38mm) core
Ribbon Width Range	1.0 - 4.5" (25 - 114 mm)
Ribbon Roll Capacity	Matched to media: approx. 1476′ (450 m) long
Ribbon Core:	1.010″ ± .006″ (25.6 mm ± .2 mm) inner diameter.

Communications

Interface	USB, RS-232 (DB-9), and IEEE 1284 Compliant Centronics Parallel
Baud Speed	600 to 38,400 bits per second (BPS)
Handshaking	Xon/Xoff, CTS, DTR
Parity	Even, Odd, or None
Stop Bits	1 or 2
Data Bits	7 or 8

Embedded Fonts and Barcodes

The printer is equipped with the most popular industry fonts and bar codes; see the *Class Series 2 Programmer's Manual* for full listings and detailed information.

Non-display printers	Display-equipped printers
▪ 9 Bit Map Fonts; rotated 0, 90, 180, 270 degrees. ▪ 10 smooth bitmap fonts 6pt – 48pt	▪ 9 Bit Map Fonts; rotated 0, 90, 180, 270 degrees. ▪ 10 smooth bitmap fonts 6pt – 48pt ▪ AGFA Scalable Font Engine featuring CG Triumvirate™ regular and bold-condensed scalable fonts with dynamic font attributes.

Approved Media

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

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

Media Dimensions			
Designator	Description	Maximum [1]	Minimum[1]
A	label width	4.65	.75
B	liner width	4.65	.75
C	gap (or notch) between labels[3]	.25	.100
D	label length[3]	–	.250
E	media thickness	.0100	.0025
F	notch opening width	.500	.200
G	distance from the media's edge to the media sensor aperture (left justified)	2.250	.200
H	reflective (black) mark width[2]	4.65	.500
I	distance between reflective marks[3]	–	.500
J	reflective mark length[3]	–	.100
K	label repeat distance[3]	–	.350

[1] Units of measure given in inches.
[2] The reflective (black) mark must be carbon based, placed on the backside of the stock, and the reflectance shall be less than 10% at wavelengths of 950 and 640 nm.
[3] The maximum allowable length of the combined label and gap (or mark) measurement cannot exceed 99.99 inches.

B GPIO Port

The printer can easily be programmed to interface with most applicator devices. The GPIO functions can be enabled and configured via the menu system of the printer via the DMXConfig program or on through the front panel on display equipped printers. Configured parameters are stored in non-volatile memory and saved for subsequent power-ups.

Printing with GPIO: When the GPIO functions are enabled, the printer will not print a label until the "Start of Print" signal goes active.

☑ When a label is ready to print but awaiting a Start of Print signal, the prompting operation differs slightly depending upon equipment:

>   *Non-display models* – The STOP LED will flash.

>   *Display-equipped models* – The display will indicate "WAITING FOR SIGNAL."

GPIO Port Configuration

The connection to the GPIO signals can be accessed via the Option Port connector (an 8-pin Molex Microfit 3, P/N 44300-800) on the front of the printer, or via the J6 connector (an AMP, P/N 640456-8) on the Main PCB. The pin-outs for the respective connectors (as viewed when facing the printer) are as follows:

Option Port Connector	Main PCB – Connector J6
<table><tr><td>8</td><td>6</td><td>4</td><td>2</td></tr><tr><td>7</td><td>5</td><td>3</td><td>1</td></tr></table>	1 2 3 4 5 6 7 8

Each GPIO pin function is detailed in the table below:

GPIO Port Connections and Functions				
Pin #	Signal Name	Signal State	Signal Direction[1]	Signal Description [2]
1	Vcc	+5 VDC	Output	Printer: Max +5 VDC, 100mA
2	Printer Fault	Low	Output	Goes low upon printer detection of a fault condition. Max +5 VDC, 100mA
3	Spare	Reserved	Input	Must be pulled high with 1k Ohm resistor (see sample SOP circuit, below).
4	Start of Print (SOP)	Programmable	Input	When active, will begin print. Recommend only setting this signal to ACTIVE LOW. When ready to print a label, the applicator should hold this signal low for at least 50ms – or until EOP goes not active. See sample SOP circuit, below. Max +3.27 VDC, +/-5mA
5	End of Print (EOP)	Programmable	Output	Signifies the end of the print process. Can be monitored to initiate next Start of Print sequence. Minimum signal time 30ms. Max +5 VDC, 100mA
6 & 8	Signal Ground	Ground	N/A	Ground
7	+24 VDC	500mA	Output	Printer: Max +24 VDC, 500mA

[1] Given relative to the printer.
[2] The operation of this multi-function port is configuration dependent. For GPIO operation, disable all optional functions not used (i.e., Present Sensor and Cutter) and set GPIO to "YES" (or on display-equipped models set GPIO Device to "APPLICATOR"). Use the Configuration Set command (<STX>Kc), or program the selections on non-display models via the "Printer Setup Menu List" or on display-equipped models via the "Menu System."

Sample SOP Circuit
Pin 3 should be pulled to +5VDC. In addition, connections for the external Start of Print control can either be directly made to Pin 4 of the Option Port (or Main PCB connector) using a TTL-level input, or via an interface circuit (similar to the one shown). For more information, see the table below.

GPIO Port Specifications	
V_{in} max	5.5 VDC maximum input into any pin
V_{IH}	3.8 VDC minimum (high level input voltage)
V_{IL}	0.36 VDC maximum (low level input voltage)
I_{OH}	-8 mA typical, - 25 mA maximum (high level output current)
I_{OL}	8 mA typical 25 mA maximum (low level output current)
V_{OH}	I_{OH} = -8 mA, minimum 3.8 VDC
V_{OL}	I_{OL} = 8 mA, maximum .44 VDC

C Paper Menu Setup

C.1 Printer Setup Mode - Button Functions

In 'Printer Setup' mode, the buttons control the setting of the printer's operational items such as media settings, communications, and options as detailed below.

☑ Before entering Setup Mode, exit Peel Mode (or, if equipped, disable the optional Present Sensor) as unpredictable results can otherwise occur.

While faults are disabled during setup, they can still occur when printing "test" labels.

To discard changes and revert to previous values, turn off printer power.

To change Printer Setup:

PAUSE *(Press and hold during power-up until the STOP light turns off)*

Printer Setup Mode

PAUSE *Prints the 'Printer Setup Menu List'*

FEED *(Press and Release) Feeds one label for "test"*

FEED *(Press and Hold) (Enters Printer Setup)*

CANCEL *Prints the 'Test Label' for "test"*

PAUSE + CANCEL *Saves the current values and resumes Normal Mode* → **DONE**

Printer Setup Procedure *(Current Item and Value is printed)*

PAUSE *Increments item's value*

FEED *(Press and Release) Selects the next menu item*

(Press and Hold) "Direct Select" menu item
eg. 7 Error light flashes = Baud Rate menu item #7

CANCEL *Decrements item's value*

PAUSE + CANCEL *Accepts the current values for "test"*

Printer Setup Menu List

The Printer Setup Menu List label, shown below, contains the printer's current values for each menu item that can be modified via the front panel.

The Menu Item Numbers correspond to the item's position in the Menu List for selection when pressing the ⬌⊗ FEED button during the Printer Setup Procedure. For example to "Direct Select" the BAUD RATE Menu Item press and hold the ⬌⊗ FEED button for 7 flashes of the ⃠ ERROR light and then release or for the TOF GAIN item hold ⬌⊗ FEED for 12 flashes, etc.

Menu Item Numbers   Values   Menu Items

```
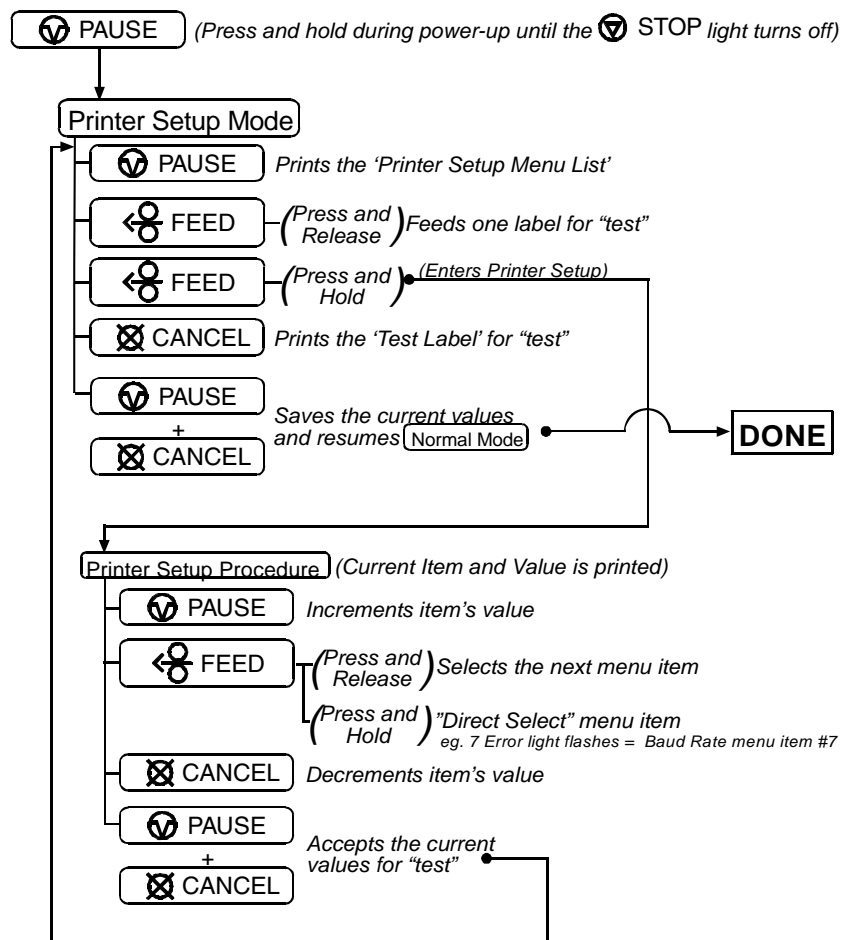 1)    DIRECT       = MEDIA TYPE
 2)    EDGE         = SENSOR TYPE
 3)    NO           = PRESENT SENSOR
 4)    NO           = CUTTER EQUIPPED
 5)    127          = SOP ADJUST,  0.005 in.
 6)    127          = PRESENT ADJUST, 0.005 in.
 7)    9600         = BAUD RATE,  bps
 8)    8            = DATA BITS
 9)    STD          = CONTROL CODES
10)    100          = CONT FORM LENGTH,  0.01 in.
11)    3            = OOS MAXVOLT,  0.1 Volts
12)    12           = TOF GAIN
13)    10           = TOF DELTA,  0.1 Volts
14)    0            = TOF LOW,  0.1 Volts
15)    426          = LABEL WIDTH,  0.01 in.
16)    64           = SCALABLE FONT,  4KB
17)    128          = INTERNAL MODULE,  4KB
18)    NO           = LABEL ALIGNMENT
19)    100          = ALIGNMENT LENGTH, 0.01 in.
20)    AUTO         = OPTION CONTROL
21)    DPL          = INPUT MODE
22)    STANDARD     = DPL EMULATION
23)    10           = HEAT
24)    NO           = EXACT TIME
25)    NO           = GPIO
26)    NO           = NO REPRINT
```

Menu Items and Values

The table below details the Printer Setup Menu List items with a brief description of the item's function, and the possible values. A "*" denotes the default setting.

1) MEDIA TYPE	2) SENSOR TYPE	3) PRESENT SENSOR
Sets printing for direct thermal (no ribbon) or thermal transfer (ribbon) media.	Selects the sensor type used to detect the media's Top Of Form (TOF) mark.	Enables/Disables the optional Present Sensor feature.
Possible Values:	**Possible Values:**	**Possible Values:**

* DIRECT THERMAL
  THERMAL TRANSFER
	* EDGE: gap / notch TOF marks
	
	  REFL (Reflective): black marks
	  CONT (Continuous): no TOF
	  marks
		* AUTO
		  NO
		  YES

4) CUTTER	5) UNITS OF MEASURE	6) ROW ADJUST
Enables/Disables the optional Media Cutter feature.	Sets the printer to interpret measurements as metric or imperial values.	Shifts the vertical start of print position (in xxx dots).
Possible Values:	**Possible Values:**	**Possible Values:**

* AUTO
  NO
  YES
	* Imperial
	  Metric
		Range: 0 – 255; nominal = *128
		
		(0 = close to edge; 255 = farthest from edge)

7) COLUMN ADJUST	8) PRESENT ADJUST	9) BAUD RATE
Shifts the horizontal start of print position (in xxx dots).	Specifies an additional amount to feed the label after printing.	Sets the serial port baud rate. (Must match the host setting).
Possible Values:	**Possible Values:**	**Possible Values:**
Range: 0 – 255; nominal = *128 (0 = close to edge; 255 = farthest from edge)	Range: 0 – 255; nominal = *128 (0 = close to edge; 255 = farthest from edge)	600 to 38.4k; default = *9600 BPS

10) DATA BITS	11) CONTROL CODES	12) LABEL LENGTH
Sets the serial data word length (Must match the host setting).	Allows code selection listed in Programmer's manual.	Sets the page (label) size when the 'SENSOR TYPE' is set to continuous media.
Possible Values:	**Possible Values:**	**Possible Values:**

* 8
  7
	* (STD) Standard Codes
	
	  (ALT) Alternate Codes
		Range: 0 – 9999; default = *100
		(Units = .01 inch)

13) LABEL WIDTH	14) SCALABLE FONT	15) INTERNAL MODULE
Sets the label width.	Sets the number of memory blocks to allocate for scalable fonts.	Sets the number of memory blocks to allocate for the internal RAM module.
Possible Values:	**Possible Values:**	**Possible Values:**
Range: 75 – 426; default = *426 (Units = .01 inch)	Range: 0 – 128; default = *64 (Units = 4K Bytes)	Range: 0 – 128; default = *128 (Units = 4K Bytes)

16) PRESENT DISTANCE	17) LABEL ALIGNMENT	18) ALIGNMENT LENGTH
Sets label stopping (and in certain cases the starting) location for different printer configurations.	Sets the label alignment method.	Leading edge distance of two successive labels. Must be entered if 'LABEL ALIGNMENT' is set to Yes (see Appendix C.2).
Possible Values:	**Possible Values:**	**Possible Values:**
* AUTO (Automatically sets the stop location. Installed options will be 'auto-sensed' and the appropriate stop position will automatically be set. Host commands are ignored.) HOST (Sets stop position according to options installed. If no options are installed the printer sets stop location to the next label's start of print. Host commands will override.)	YES (user manually determines 'ALIGN LENGTH') AUTO (printer determines 'ALIGN LENGTH') *NO (no Label Alignment used)	0 – 999; default =100* (Units = .01 inch)

19) INPUT MODE	20) DPL EMULATION
Selects between the standard or template interpretation of incoming data.	This instructs the firmware to process specific DPL data (Start of Print, DPI, and Imaging function) according to the selected printer emulation.
Possible Values:	**Possible Values:**
* DPL (printer constructs the label using the standard DPL commands) LINE (printer constructs the label using a preloaded template form)	* STANDARD ALLEGRO (Allegro Emulation) P PLUS (Prodigy Plus Emulation) PRODIGY (Prodigy Emulation)

21) HEAT	22) IMAGING MODE
Controls the 'burn-time' of the printhead. This is the equivalent of Heat Setting on most label software programs.	This command instructs the printer whether to pre-image the label format:
Possible Values:	**Possible Values:**
Range: 0 – 30; default = *10	* 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.)

23) GPIO	24) FAULT HANDLING
Sets the printer's option port to function for GPIO applications, (see Appendix B for more information).	When a fault condtions is detected, printing stops and the ERROR light turns on. After the problem is corrected, the FEED Key must be pressed to clear the fault. The label in process is *not* reprinted.
Possible Values:	**Possible Values:**
YES or NO; default = *NO	YES or NO; default = *NO *(NO = NO REPRINT" disabled, reprinting will occur.)*

25) HEAT COMMANDS	26) SPEED COMMANDS
This command causes the printer to ignore DPL Heat commands; instead, the Heat value is controlled via the menu setting.	This command causes the printer to ignore DPL speed commands; instead, speed values are controlled via the menu setting.
Possible Values:	**Possible Values:**
* ENABLED DISABLED	* ENABLED DISABLED

☑ All of the values for these Menu Items will be stored in non-volatile memory for future power-ups.

Step by Step Modification of the Printer Setup

The following is an example of Printer Setup modification. Although this example will detail how to modify the serial Baud Rate, the same method can be used to change any of the printer's menu item settings.

☑ It is recommended that the Printer Setup Mode not be entered while in Peel Mode or with the optional Present Sensor enabled. Depending on label size this can cause unpredictable results.

1. With printer 'Off' and properly loaded with media, press and hold the ⊘ PAUSE button while powering 'On' the printer. Continue to hold the button until the ⊘ STOP light turns off, and then release it.

2. Press and hold the ⊷ FEED button and count 7 flashes of the ⊘ ERROR light, then release it. The following printout should be produced:

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

3. Press the ⊘ PAUSE button one time to increment to the 19200 bps value. The following printout should be produced:

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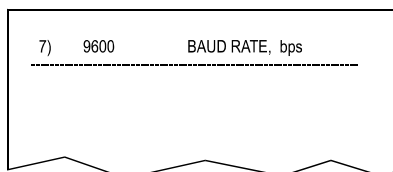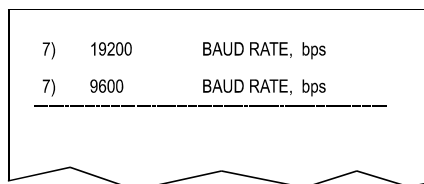
   7)    9600          BAUD RATE,  bps
   ----------------------------------------
```

4. At this point you will accept the current values for "test" and exit the Printer Setup Procedure by simultaneously and briefly pressing the ⊘ PAUSE + ⊗ CANCEL buttons. Wait until the ⊘ STOP light goes off.

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

5. Now you can save your changes and resume [Normal Mode] by simultaneously and briefly pressing the ⊘ PAUSE + ⊗ CANCEL buttons. Wait until the ⊘ STOP light goes off.

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

Label 1

```
WED NOVEMBER 10, 2003 21:41:31 323
VER: M4206 - 05.08 11/07/03
BOOT 83-2383-05E              COUNTER INFORMATION
CODE 83-2385-05H              ABSOLUTE VALUES    7-16-2003
FPGA 83-2384-05B               LENGTH____       773 INCHES
FONT 83-2460-01C               TIME_____        20 HOURS
UMOD 83-2472-01A              RESETTABLE VALUES 7-16-2003
 256K FLASH MODULE B           LENGTH____       969 INCHES
SYSTEM FLASH SIZE_____2 MBYTES  TIME_____        56 HOURS
SYSTEM RAM CHECKS____ GOOD
SYSTEM RAM SIZE___ 4096 KBYTES  MEMORY CONFIGURATION
SYSTEM RAM AVAIL__ 3180 KBYTES  INTERNAL MODULE A_____  128
                              SCALABLE FONTS_____   64
AUTO DETECTION                LABEL SIZE     0426:10912 IN
 CUTTER_____NOT DETECTED
 PRESENT SENSOR____NOT DETECTED
 CURRENT STOP LOC__TEAR

EXPRESS SETUP
 MEDIA SENSOR_____EDGE
 PRINT METHOD_____TRANSFER
 OPTION CONTROL____AUTO


INPUT VALUES
PAPER_____ 207
POT_____  33
TRAN_____ 157
REFL_____   0
RIBN_____ 237
TEMP_____  64
VOLT_____ 218
PRESENT SENSOR____   0
```

Label 2

```
CONFIGURATION
SERIAL PORT SELECTED
19.2; 8BITS  ◀──────────────●
EDGE
MEDIA TYPE_____ TRANSFER
CONT FORM LENGTH__   0
PRESENT ADJUST____  128
SOP ADJUST_____  128
TOF LOW_____   0   0
TOF DELTA_____  10  10
TOF GAIN_____   7   5
OOS MAXVOLT_____   3   2
LABEL ALIGNMENT___  AUTO
ALIGN LENGTH_____  611
OPTION CONTROL____  AUTO
INPUT MODE_____  DPL
DPL EMULATION_____  STANDARD
HEAT_____   10
EXACT TIME_____  NO
GPIO_____  NO
NO REPRINT_____  NO
SYMBOL SET_____  PM
FONT SUBSTITUTION_ NONE

IGNORE COMMANDS
SYMBOL SET SELECT_ NO
CNTRL CODES_____ NO
HEAT_____ NO
SPEED_____ NO
SOP OFFSET_____ NO
```

C.2 Label Alignment

The Label Alignment function is intended for use when the label length is less than the distance between the printhead and the media sensor or where label waste at power-up is a concern. Label Alignment (see table below) is not recommended for label lengths greater than 6.5 inches or for media containing 2 or more form lengths.

Label Stock	Label Alignment Setting
Continuous	NO
6.5 inches or less	YES or AUTO
6.5 inches or more	NO
Multiple length labels	NO

The Label Alignment function is chosen via the menu system or by host commands. The three possible modes, YES, AUTO, and NO, are detailed in the following sections.

Label Alignment = YES

In this mode, the operator must supply an 'ALIGN LENGTH' value. This value must be physically measured from leading edge to leading edge of two successive labels, as shown. The measurement must be as accurate as possible. For very short labels, errors as small as 0.01" can result in noticeable print variations on the labels between the media sensor and the printhead.

The measured value must be sent to the printer via the host computer or entered using the Printer Setup Mode.

Then, in Normal Mode, press and hold the ⟷ FEED button (about 4 seconds). The printer will align the label to the top of form position.

☑ If media with a different label length is subsequently loaded, the 'ALIGN LENGTH' must be recalculated and re-entered.

Label Alignment = AUTO

In this mode, the printer automatically calculates the 'ALIGN LENGTH' thus eliminating the need to physically measure the label. This mode is usually preferred in applications that require frequent media changes to labels of different lengths.

To perform an Auto Alignment, in Normal Mode press and hold the ⬡ FEED button (about 4 seconds). The printer will feed labels to calculate the label length. Following the calculation, the printer will save the measurement and align to the top of form position. Auto Alignment can result in wasted labels during the measurement process (the longer the label length the greater the waste).

Auto Alignment with the Present Sensor enabled:

If the printer is equipped with the Present Sensor option and that feature is enabled, while the label length is calculated the printer will pause and illuminate the ⬡ STOP light after each movement. The operator must press the ⬡ PAUSE button for the alignment to continue. This allows the operator to remove any labels as required; however, labels should not be forcibly removed since they may not actually be positioned for removal, but at an interim position required for measurement.

Label Alignment = NO

When Label Alignment is not enabled (i.e., set to NO), printing begins at the current label position without alignment, assuming the label is at the start of print position. Additionally, if the label length is short, labels between the printhead and the media sensor may be unused.

Label Alignment Troubleshooting

If you experience label alignment problems, the following table offers possible causes and solutions.

Problem	Possible Cause	Solution
Attempting to perform Label Alignment results in no paper movement.	With the Present Sensor enabled, Label Alignment cannot be performed without a Label Length.	➢ Set Label Alignment to AUTO, press and hold ✢ FEED until media moves for the automatic length measurement. *~OR~* ➢ Re-measure the Label Alignment Length. Use Printer Setup mode to enter the new length. Print a Database Configuration label to ensure the new length has been set.
First label is wasted during alignment. All labels thereafter print to the correct start of print position.	Alignment Length is too long. *~OR~* For labels whose length and stop position cause them to stop between labels on the media sensor, the alignment function can result in wasted labels.	➢ Set Label Alignment to AUTO, press and hold ✢ FEED until paper moves for automatic Label Alignment length measurement. *~OR~* ➢ Re-measure Label Alignment Length, use Menu Setup to set new length, ensure desired length has been set. ➢ Obtain a slightly different label Alignment Length measurement. Using the Label Alignment AUTO mode, hold the ✢ FEED button to force an alignment and label measurement. Ensuring slack in the label stock may result in a slightly different measurement. The Alignment Length may also be set manually via the Setup Menu. Increasing or decreasing the value by 1 or 2 units (inches/100) may help to prevent the wasted labels; however, this may result in incorrect print positions for labels that are short in length.
Label Alignment is incorrect. Pressing ✢ FEED successively results in a short label length, one-inch.	Label Alignment Length is not correct. The default Label Alignment Length is 1.00″, and will result in this behavior when any larger label length is used without setting the appropriate length.	➢ Set Label Alignment to AUTO. Press and hold ✢ FEED until paper moves for automatic Label Alignment Length measurement. *~OR~* ➢ Measure the label length and use the Setup Menu to set the new length. Print a Database Configuration label to ensure the new length has been set.

Problem	Possible Cause	Solution
Label Alignment is incorrect. Pressing ✛ FEED successively results in a label length longer than actual, one-inch.	Label Alignment Length is not correct. The default Label Alignment Length is 1.00″, and will result in this behavior when any larger label length is used without setting the appropriate length	➢ Set Label Alignment to AUTO. Press and hold ✛ FEED until paper moves for automatic Label Alignment length measurement. *~OR~* ➢ Measure the label length and use the Setup Menu to set the new length. Print a Database Configuration label to ensure the new length has been set.
Tear Mode is selected but the label stop position (present position) is not far enough forward.	Another present position has been determined. Enabling the Present Sensor causes the label stop position (present position) to be approximately 0.1″ behind the peel bar. *~OR~* The Present Adjust value is not correct.	➢ Disable the Present Sensor. *~OR~* ➢ Ensure the host computer is not providing a Present Distance shorter than is required for the Tear Bar. ➢ Use the Setup Menu to modify the Present Adjust value.
Tear Mode is selected but the label stop position (present position) is too far forward.	Another present position has been determined. *~OR~* The Present Adjust value is not correct.	➢ Ensure the host computer is not providing a Present Distance longer than is required for the Tear Bar. ➢ Use the Setup Menu to modify the Present Adjust value.
The ⊘ ERROR light illuminates during label alignment.	The label supply is empty	➢ Load media.

C.3 Calibration Mode – Button Functions

In 'Calibration' mode, the buttons allow the printer to adjust to the media being used. Calibration can be performed either automatically or manually, as detailed below.

Before calibrating, ensure that the Printhead Carrier Assembly is latched down, that the cover is closed, and that the media sensor has been set for the appropriate media type.

☑ Printer and cutter faults are disabled during ⌊Auto Media Calibration⌋ and ⌊Media Sensor Calibration⌋, but can still occur while printing "test" labels.

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

To perform Calibration:

| ⊠ CANCEL | *(Press and hold during power-up until the* ⊘ STOP *light turns off)* |

Calibration Mode

⊘ PAUSE

Auto Media Calibration

⇐⊖ FEED   *(Press and Release)* Feeds one label for "test"

⇐⊖ FEED   *(Press and Hold)*   *(Until Paused light turns off)*

⊠ CANCEL   *Prints the 'Test Label' for "test"*

⊘ PAUSE
+
⊠ CANCEL   *Saves the current values and resumes* ⌊Normal Mode⌋   → **DONE**

Media Sensor Calibration

⊘ PAUSE   *Analyze for 'Paper'*

⇐⊖ FEED   *Analyze for 'Backing or 'Mark'*

⊠ CANCEL   *Analyze 'Out of Media' condition*

⊘ PAUSE
+
⊠ CANCEL   *Accepts the current values for "test"*

Auto Media Sensor Calibration

Auto Media Sensor Calibration automatically establishes the optimum sensing values for the media you are using.

☑ *Before calibrating, be sure the media sensor is set for the appropriate media type, also ensure that the Printhead Carrier Assembly is latched down and the cover is closed.*

To automatically calibrate the media sensor:

1. With the desired media loaded, hold the ⊠ CANCEL button while powering up the printer. Continue to hold the button until the ⊘ STOP light turns off then release it.

2. Next press the ◐ PAUSE button. The printer will feed approximately ten inches of media to calculate the TOF Delta and Low values to be used.

3. Upon completion, one of the following lights will flash five times to denote the result of the auto calibration attempt:

   ⊘ STOP Light = Successful calibration. Proceed to Step 4.

   ⊘ ERROR Light = Unsuccessful calibration, try again. If the calibration continues to fail proceed to Manual Media Sensor Calibration.

   ☑ If you wish to discard the changes and revert back to the previous calibration simply turn off the printer before Step 4.

4. Now save the changes and resume [Normal Mode] by pressing the ◐ PAUSE + ⊠ CANCEL buttons simultaneously and briefly. Wait until the ⊘ STOP light goes off.

Manual Media Sensor Calibration

The Manual Media Sensor Calibration procedure should be used in cases where the printer continues to suffer from media sensing problems after performing or attempting to perform the Auto Media Sensor Calibration.

✅ Before calibrating, be sure the media sensor is set for the appropriate media type, also, ensure that the Printhead Carrier Assembly is latched down and the cover is closed.

To manually calibrate the media sensor:

1. Hold the ⊠ CANCEL button and power-up the printer. Continue to hold the button until the ⊘ STOP light turns off; then release the button. Next, press and hold the ⊷ FEED button, continue to hold the button until the ⊘ STOP light turns on; then release the button.

2. Remove all the material from the media sensor, close the Printhead Carrier Assembly, and then press the ⊠ CANCEL button. *The printer will flash the* ⊘ ERROR *light as it analyzes the no media condition.*

3. Position the backing material or the black (reflective) mark in the media sensor, close the Printhead Carrier Assembly, and then press the ⊷ FEED button. *The printer will flash the* ⊘ ERROR *light as it analyzes the top of form mark.*

4. Place the media with the backing attached (if any) in the media sensor, close the Printhead Carrier Assembly, and then press the ⊘ PAUSE button. *The printer will flash the* ⊘ ERROR *light as it analyzes the material.*

5. Simultaneously and briefly press the ⊘ PAUSE + ⊠ CANCEL buttons to accept the calibration for "test" and exit ⌈Media Sensor Calibration⌋. One of the following lights will flash five times to denote the result of the manual calibration attempt:

   ⊘ STOP Light = Successful calibration. Proceed to Step 6.

   ⊘ ERROR Light = Unsuccessful calibration. Retry the procedure beginning at Step 1.

6. Use the ⊷ FEED button (feeds a label), and the ⊠ CANCEL button (prints a test label) to test the current calibration.

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

7. Now save the changes and resume ⌈Normal Mode⌋ by pressing the ⊘ PAUSE + ⊠ CANCEL buttons simultaneously and briefly. Wait until the ⊘ STOP light goes off.

_D_ Changing the Language

D.1 Changing the Menu Language

Different languages and / or Datamax-O'Neil-provided translations can be downloaded to replace the standard (English) menu of the printer by changing the spreadsheet that defines the system dictionary. To change the language you will add a new language column (or modify the existing column) in the spreadsheet, click on the "Generate DPL file(s)" radio button, and then send that file(s) to the printer.

Software requirements for modifying the menu language are as follows:

- Microsoft$^®$ Excel must be purchased by user;

- Img2dl.exe (provided at ftp://ftp.datamax-oneil.com/Anonymous/Firmware/EFIGS/) is a program used during the process to create the DPL file; and,

- Common.xls (also provided at the web site above) is the Menu Dictionary.

☑   _Place Img2dl.exe and Common.xls in the same directory._

Create a Menu Language by following these steps:

A.   Invoke Excel and open the Common.xls file. _After the file opens, the following screen appears:_

B. Click the "Enable Macro" box. *The following screen appears:*

C. Click on Column J and enter the new language, or modify an existing one. Some tips on this process:

- 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; however, if "cutting and pasting" fields, this warning system may be defeated.)

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

- Comments – This field can be modified with no effect.

D. After editing is complete, highlight all of the columns to be created by pressing the letter above the column (more than one column can be selected).

E. Press the Generate DPL File(s) radio button. *A file will be generated for each of the selected columns and Excel will provide confirmation (for example, as shown below, small.ls).*

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

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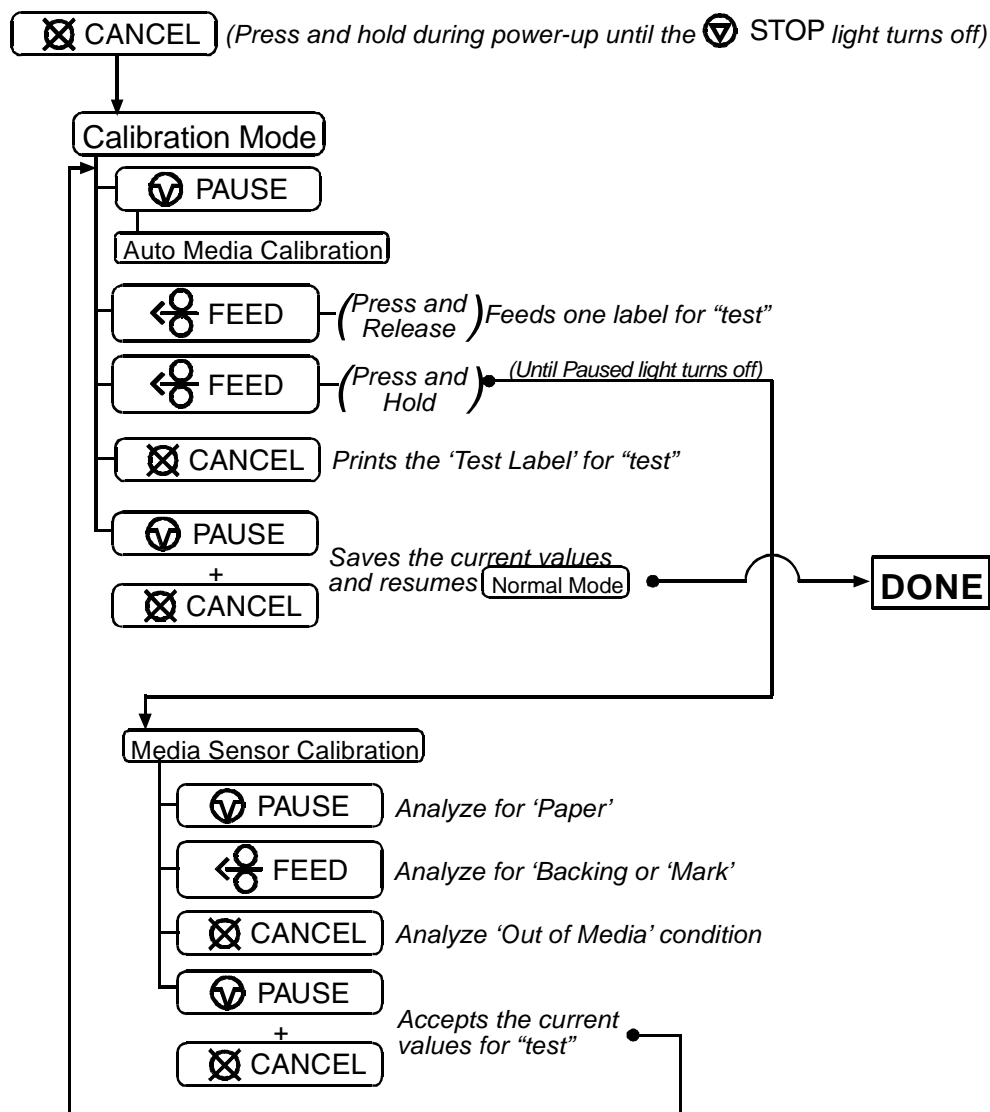copy small.ls lpt1: /b
```

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

H. After resetting, verify operation by printing a Configuration Label (see Section 4.4). *New language information will be printed under SYSTEM INFORMATION / OPTIONAL LANGUAGES. (Also, the new language will appear on the display as a menu item in SYSTEM SETTINGS / MENU LANGUAGE. These are the only methods to determine a successful download.)*

Enable the new language. Enter the menu system and go to SYSTEM SETTINGS / MENU LANGUAGE and select the new language *(A reset will occur as font validation is performed.)*

Afterward, reenter the menu system and go to SYSTEM SETTINGS / MENU LANGUAGE and select the desired font for the language. Save the changes when prompted.

An error has occurred if the printer displays the new language selection, but all messages remain in English. In this case, re-check your process or contact Datamax-O'Neil Technical Support (be ready to provide the Common.xls and DPL download files created). Other error messages are also possible:

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.

I. Repeat Steps A – H using the filename misc.xls to translate printer option items. This will output small20.ls.

D.2 Advanced File Handling Information

- The standard 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-O'Neil 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.

- Deletion of the selected language will reset 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 five.

- The screen shot below is an example of Unicode defined languages, Chinese & Russian. Note the only additional information required is the "double" in row 1.

	I	J	K	L	M
1				Double	Double
2	**ESPAÑOL**	**small**	**TREK**	**Chinese**	**RUSSIAN**
3	LISTO	ready	AWAITING ORDERS	准备	ГОТОВ
4	IMPRIMIENDO	printing	WARP DRIVE ENGAGED	打印中	ПЕЧАТЬ
5	EN PAUSA	paused	ALL STOP	暂停	ПАУЗА
6	CANCELAR IMPRESIÓN	cancel batch?	ABORT MISSION?	取消	ОТМЕНИТЬ ЗАДАНИЕ?
7	BORRAR ERRORES	clearing faults	RE-INITIALIZING	清除错误	СБРОС ОШИБОК
8	DE	of	FACTOR	OF	ОФ
9		advanced menu	KNOWLEDGE BASE	高级菜单	МЕНЮ
10	ERROR DE SISTEMA	system fault	DIRECT HIT SUSTAINED	系统错误	СИСТЕМНАЯ ОШИБКА
11	ERROR DE ADC	adc fault	HULL BREACH DECK TEN	ADC错误	ОШИБКА ADC
12	CABEZAL LEVANTADO	head up fault	ENGINES OFFLINE	打印头抬起错误	ТЕРМОГОЛОВКА ПОДНЯ
13	ERROR DE CINTA	ribbon fault	PHASORS OFFLINE	碳带错误	ОШИБКА РИБОНА
14	ERROR INICIO ETIQ.	top of form fault	UNABLE TO GO TO WARP	TOF错误	ОШИБКА ГРАНИЦ ЭТИК
15	SIN PAPEL	out of stock	TORPEDO TUBES EMPTY	标签用完	ОТСУТСТВУЕТ ЭТИКЕТ
16	ERROR DE CORTADOR	cutter fault	CASCADE FAILURE	切刀错误	ОШИБКА РЕЗАКА
17	ERROR DE VERIFICADOR	verifier fault	TRACTOR BEAM FAILURE	检测器出错	ОШИБКА ВЕРИФАЕРА
18	ERROR ECONOM. CINTA	ribbonsaver fault	METAPHASIC FAILURE	碳带节约装置错误	ОШИБКА РИБОНСЕЙВЕР
19	ERROR DE POSICION	position fault	UNKNOWN COORDINATES	位置错误	ОШИБКА ПОЛОЖЕНИЯ
20	FALLO DE TEMPERATURA	temperature fault	CORE TEMP. CRITICAL	温度错误	ОШИБКА ТЕМПЕРАТУРЫ
21	ERROR DMA	dma fault	COMPUTER MALFUNCTION	DMA错误	ОШИБКА DMA
22	ERROR MOTOR IMPRES.	print engine fault	PORT NACELL OFFLINE	打印引擎错误	ОШИБКА ДВИГАТЕЛЯ
23	24V FUERA TOLERANCIA	24v out of tolerance	SAFETY LIMT EXCEEDED	电压越界	ОШИБКА ВОЛЬТАЖА, 2
24		present sensor fault	INERT. DAMP. OFFLINE	出纸检测器错误	ОШИБКА ДАТЧИКА НАЛ
25	ADVERTEN. CORREGIDA	warning resolved	ALL CLEAR	警告	ПРОБЛЕМА УСТРАНЕН
26	CINTA BAJA	ribbon low	TORPEDO TUBES LOW	碳带不多	КОНЧАЕТСЯ РИБОН
27		head/cover up fault	LANDING FAULT	打印头抬起错误	ПОДНЯТА КРЫШКА
28	FALLO PUNTO CABEZAL	dot failure	SHIELDS COMPROMISED		ОШИБКА ТЕРМОГОЛОВК
29		label rotation	SYMMETRY INVERSION	标签旋转	ЭТИКЕТКА ПОВЕРНУТА
30	CAMBIOS PENDIENTES	host changes pending	HOSTILE APPROACHING	主机更改评估中	ОБНОВЛЕНИЕ ХОСТА |