

**MODEL 485TM**  
**DIRECT THERMAL PRINTER**  
**OPERATOR'S MANUAL**

PART NUMBER: 880063-0100

January 3, 2018 CPC

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# Table of Contents

<b>INTRODUCTION .....</b>	<b>V</b>
 <b>CHAPTER 1: PRINTER SPECIFICATIONS</b>	 <b>1-1</b>
1.1 General Specifications	1-1
1.2 Printing Specifications	1-1
1.3 Media Specifications	1-2
 <b>CHAPTER 2: FEATURES AND OPTIONS</b>	 <b>2-1</b>
2.1 Fonts	2-1
2.2 Graphics	2-1
2.3 Bar codes	2-1
2.4 Special Features	2-2
2.5 Options	2-2
 <b>CHAPTER 3: GETTING STARTED</b>	 <b>3-1</b>
3.1 Unpacking and Inspection	3-1
3.2 Printer Power	3-2
3.3 RS232 Serial Communication Interface	3-2
3.3.1 RS-232 Serial Cables .....	3-2
3.3.2 RS-232 Serial RJ-12 .....	3-3
3.4 USB Communication Interface	3-3
3.4.1 USB HID .....	3-4
3.4.2 USB CDC ACM .....	3-4
3.4.2.1 USB CDC ACM - Windows Installation .....	3-4
3.4.2.2 USB CDC ACM - Linux Installation .....	3-4
3.5 Host USB Interface	3-5
3.6 Ethernet Communication Interface	3-5
3.7 Cash Drawer Option	3-5
3.7.1 Cash Drawer RJ12 Adapter Option .....	3-6
3.8 AUX Option	3-6
3.9 Loading Media	3-7
3.10 Print Button and Status Indicator Light	3-8
3.10.1 Print Button .....	3-8
3.10.2 Status Indicator Light .....	3-9
3.11 Printer Modes	3-9
3.11.1 Ready Mode: GREEN .....	3-9
3.11.2 Halted Mode: RED .....	3-9
3.11.3 Diagnostic Mode .....	3-10
3.11.3.1 Entering Diagnostic Mode .....	3-10
3.11.3.2 Statistics Label .....	3-10
3.11.3.3 Test Ticket .....	3-11
3.12 TOF Sensor	3-11
3.13 Media Roll Holder Option	3-12
3.14 Wristband Media Adapter Option	3-13
3.15 Qualsoft Windows Driver	3-14

3.15.1	Installing the Windows Driver .....	3-14
3.15.2	Configuring the Driver .....	3-18
3.15.3	Printer Properties Page - General tab .....	3-19
3.15.4	Printer Properties Page - Ports tab .....	3-20
3.15.5	Printing Preferences - About tab .....	3-21
3.15.6	Printing Preferences - Print tab .....	3-21
3.15.6.1	Print tab - Advanced .....	3-22
3.15.7	Print tab - Halftone Adjustment .....	3-22
3.15.8	Print tab - Halftone Properties .....	3-23
3.15.9	Print tab - User Commands.....	3-23
3.15.10	Printing Preferences - Paper tab .....	3-24
3.15.10.1	Paper tab - Rotation .....	3-24
3.15.10.2	Paper tab - Units .....	3-24
3.15.10.3	Paper tab - Page Sizes .....	3-24
3.15.10.4	Paper tab - Mirror .....	3-24
3.15.10.5	Paper tab - Default .....	3-25
3.15.11	Printing Preferences - Media tab .....	3-25
3.15.11.1	Media tab - Settings .....	3-25
3.15.11.2	Media tab - Feed Options.....	3-26
3.15.12	Printing Preferences - Presenter tab .....	3-27
3.15.12.1	Presenter tab - Configuration .....	3-28
3.15.12.2	Configuration - Modes.....	3-28
3.15.12.3	Configuration - Advanced.....	3-29
3.15.13	Printing Preferences - Modification tab .....	3-29
3.15.13.1	Modification - No of Labels.....	3-29
3.15.13.2	Modification - Print Speed (inch/s) .....	3-29
3.15.13.3	Modification - Disable Status.....	3-29
3.15.14	Printing Preferences - Save/Restore tab .....	3-31
3.15.14.1	Save/Restore - Restore settings from file.....	3-31
3.15.14.2	Save/Restore - Save settings to file.....	3-31
3.15.14.3	Save/Restore - Restore factory defaults.....	3-31
3.15.15	Status Messages.....	3-31
3.15.15.1	PRINTER_STATUS_WAITING.....	3-32
3.15.15.2	PRINTER_STATUS_BUSY .....	3-32
3.15.15.3	PRINTER_STATUS_PAPER_OUT.....	3-32
3.15.15.4	PRINTER_STATUS_PAPER_JAM.....	3-32
3.15.15.5	PRINTER_STATUS_PAPER_PROBLEM.....	3-32
3.15.15.6	PRINTER_STATUS_USER_INTERVENTIO N.....	3-32
3.15.15.7	PRINTER_STATUS_OFFLINE .....	3-32
3.15.15.8	PRINTER_STATUS_OUTPUT_BIN_FULL.....	3-32
3.15.15.9	PRINTER_STATUS_DOOR_OPEN .....	3-32
3.15.15.10	PRINTER_STATUS_IO_ACTIVE .....	3-32
3.16	Configuration Application .....	3-33
3.16.1	Selecting a Device .....	3-33
3.16.1.1	Configuration Application - Serial (USB / RS-232).....	3-33
3.16.1.2	Configuration Application - USB HID .....	3-34
3.16.1.3	Configuration Application - Ethernet .....	3-34
3.16.2	Configuring a device .....	3-34
3.16.2.1	Applying changes .....	3-35
3.16.2.2	Reverting changes.....	3-35

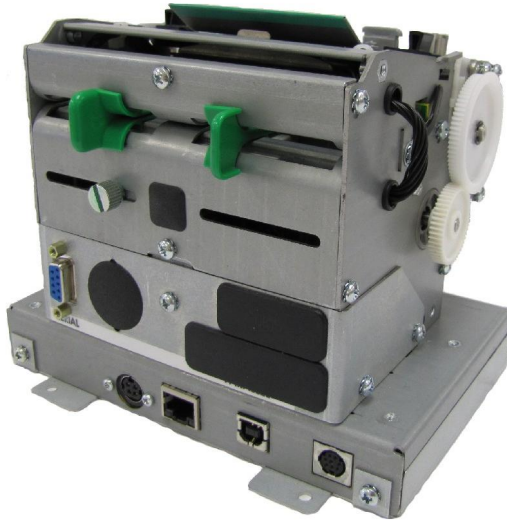
3.16.2.3	Saving/loading configuration files .....	3-35
3.16.3	Application preferences .....	3-35
<b>CHAPTER 4</b>	<b>PRINTER MAINTENANCE</b>	<b>4-1</b>
4.1	Maintenance Schedule	4-1
4.2	Thermal Printer Cleaning Card	4-1
4.3	Internal Cleaning	4-3
4.4	Print Head Maintenance	4-4
4.5	Replacing the Drive Roller	4-5
4.6	Adjusting Printhead Pressure	4-7
<b>CHAPTER 5:</b>	<b>TROUBLESHOOTING</b>	<b>5-1</b>
5.1	Troubleshooting Tips	5-1
<b>INDEX</b>		<b>6-1</b>
General Index		6-1
List of Figures		6-4
List of Tables		6-5
<b>APPENDIX</b>		<b>7-1</b>
Appendix A:	Limited Warranty	7-1
Appendix B:	RMA Procedure	7-3
Glossary		7-5
Appendix C:	User Notes	7-9



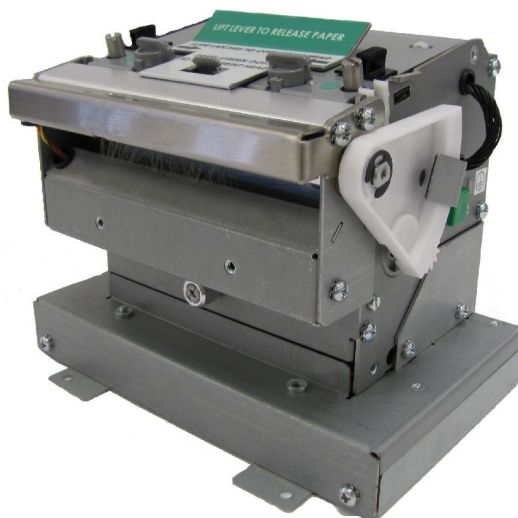


# Introduction

The Model 485TM printer has been designed to provide solutions for the ticketing industry. The printer uses the same reliable print mechanism found in the Model 428TM and 438TM printers. The print mechanism has been designed with a 4" printhead capable of printing up to 8" per second and is available in 203 or 300 dpi. The printer may be used as a graphics printer or as an FGL emulation printer.



**485TM Rear Side View**



**485TM Front Side View**



# Chapter 1: Printer Specifications

## 1.1 General Specifications

Width *	5.7" (148 mm)
Height *	6.9" (175 mm)
Depth *	5.5" (140 mm)
Weight *	5.4 lbs. (2.5 kg)
Electrical	+24 VDC
Current	3.5 Amps maximum
Temperature	40° F – 104° F (5° C – 40° C), operating
Humidity	10% – 85%, non-condensing
RAM Memory	256 Mb
Flash Memory	512 Mb
Agency Approvals	RoHS, FCC Class A, cTUVus
Interface Communications	RS232, USB, and Ethernet Ports
Flow Control	CTS/RTS Hardware
Baud Rate	Up to 115200
Parity	Odd, Even, and None
Data Bits	7 or 8

**Table 1-1 General Specifications**

*\* NOTE: Listed specifications are based on a standard print mechanism and may vary based on final configuration.*

## 1.2 Printing Specifications

Print Type	Direct Thermal
Print Resolution	203 DPI (8 dots/mm = 0.0049" per dot) 300 DPI (12 dots/mm = 0.0032" per dot)
Maximum Print Speed	Up to 10"/sec. (250 mm/sec.)
Maximum Print Width	203 DPI = 4.098" (104.10mm); 832 dots 300 DPI = 4.252" (108 mm); 1,280 dots
Maximum Print Length	26" (660 mm)
Minimum Print Length	0.25" (6 mm)

**Table 1-2 Printing Specifications**

### 1.3 Media Specifications

Media Types	Continuous, die-cut, preprinted and tag stock either rolled or fanfold
Maximum Media Thickness*	.011" (.28 mm)
Maximum Media Width	4.375" (111 mm)

\*NOTE: The printers may print on thicker media types depending on the pliability of the material; however, this requires testing and evaluation. Contact your authorized Microcom Corporation representative for additional information regarding testing and evaluation of thicker or rigid media types.

**Table 1-3     Media Specifications**

## Chapter 2: Features and Options

### 2.1 Fonts

- 16 resident bitmapped alpha-numeric fonts.
- Downloadable scalable fonts.
- All bitmapped fonts expandable in height and width.
- Reverse image printing.
- Rotated: 0 °, 90 °, 180 °, and 270 °.

### 2.2 Graphics

- Resident Lines feature.
- Storage of fonts, label formats and graphics in both volatile RAM and non-volatile FLASH memory.
- Rotated: 0 °, 90 °, 180 °, and 270 °.

### 2.3 Bar codes

- ***One-dimensional***

- Code 39
- Interleaved 2 of 5
- Code 128 (A, B, C and Auto)
- Code 93
- Codabar
- Modified Plessey
- UPC-A
- UPC-E
- EAN 8
- EAN 13
- UCC/EAN 128
- Postnet.
- Planet Code

- ***Two-dimensional***

- GS1 Databar
  - Omni Directional
  - Truncated
  - Stacked
  - Stacked Omni-directional
  - Limited
  - Expanded
- PDF-417
- Maxi code
- GS1 Data matrix
- Aztec
- Softstrip
- QR Code
- Rotated: 0 °, 90 °, 180 °, and 270 °.
- Expandable in height and width.

## 2.4 Special Features

- Easy print head cleaning
- Tool less platen roller replacement
- Adjustable media guides for easy label centering
- Automatically adjustable reflective blackline sensor in media guide
- Software controlled contrast adjustment
- Detects label gap, black line, and blow-hole using reflective and transmissive sensors
- Internal statistical counters for inches and labels printed
- Remote printer interrogation
- On-site programmable flash memory updates
- Autoload / Alignment of media

## 2.5 Options

- +24 VDC Universal 100W Desktop Power Supply
- 300 dpi print head
- Heavy Duty Rotary Cutter
- Ethernet Port
- Pre-Stock Out Sensor Assembly
- Low Paper Sensor Assembly
- Wristband Option
- Paper Supply Holders
- Media Catch Trays
- Cleaning kit

## Chapter 3: Getting Started

### 3.1 Unpacking and Inspection

The printer has been packaged in protective foam to help reduce the damage during shipment.

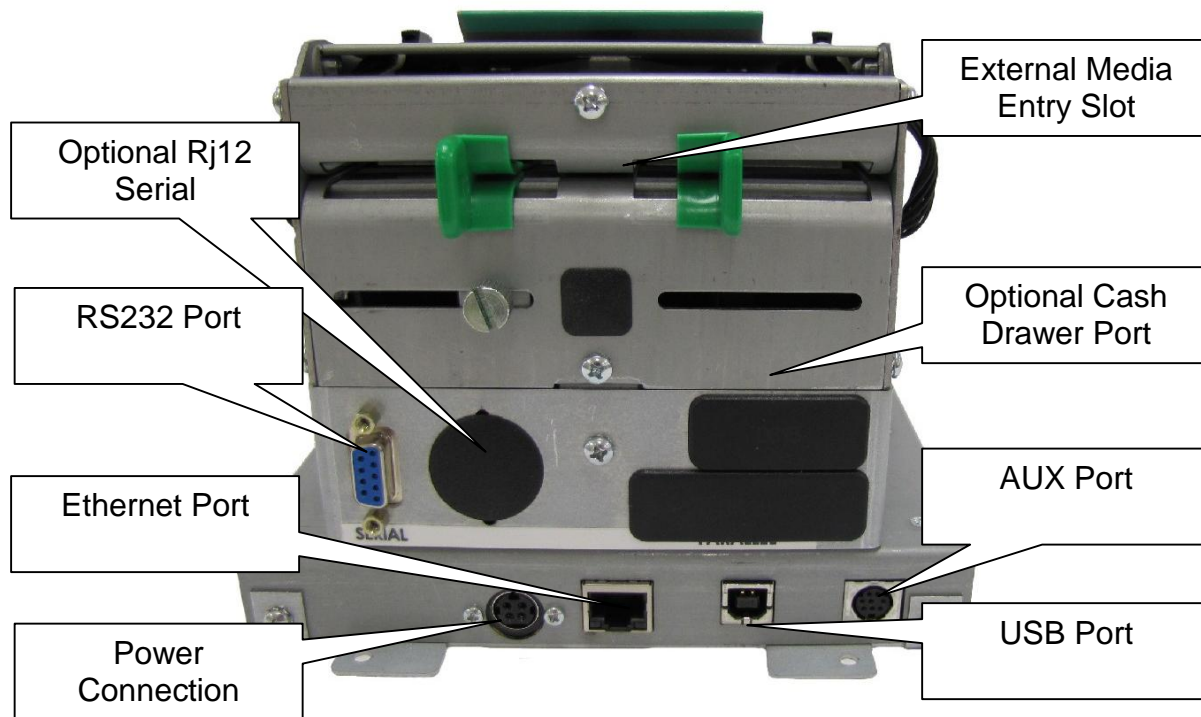
Inspect the shipping container(s) for signs of damage. If damage is evident, contact the shipping company immediately to file a damage claim.

After the printer is removed from the container(s), verify that all the items on the packing list are present and in good condition. The picture below (See Figure 3-1) shows a 438TC and optional power cord. Your shipment may contain different items.

The foam and shipping container(s) should be kept and used if the printer is to be shipped at a later time. Additional shipping materials can be ordered by contacting the Microcom Corporation Service Department.



**Figure 3-1 Typical Printer Accessories**



**Figure 3-2 Printer Rear Panel**

## 3.2 Printer Power

The printer has a universal auto-sensing internal power supply that operates in the 100-240 VAC; 50-60 Hertz range. The three-prong female end of the power cord plugs into the mating connector located on the back of the printer.

## 3.3 RS232 Serial Communication Interface

The printer provides a 9-pin female D-Sub connector, on the rear panel, for RS-232 serial communication. The printer is configured as DCE (Data Circuit-terminating Equipment) so a NULL modem cable is not necessary. A serial data cable is required to use serial communications, refer to Table 3-1 below for correct cable configurations.

The factory settings, unless otherwise requested, are set at 115200 baud, 8 data bits, 1 stop bit and no parity with hardware handshaking enabled. The baud rate is user selectable from 110 to 115,200 and uses hardware CTS/RTS handshaking.

When hardware handshaking is used, the CTS and RTS signals are required. The other signals are offered in the event that the host computer would require them.

### 3.3.1 RS-232 Serial Cables

The printer uses a standard through serial cable, typically referred to as a modem cable, which may be purchased through Microcom Corporation or a local computer supply company.

For a 25-pin serial communication port – Use a 25-pin female to 9-pin male cable.



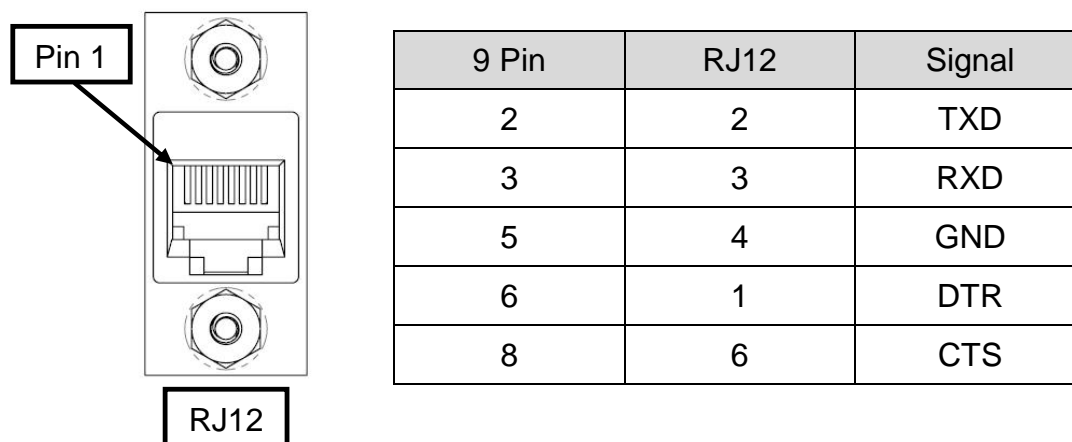
For a 9-pin serial communication port – Use a 9-pin female to 9-pin male cable.

9 to 9 Pin Cable				9 to 25 Pin Cable			
State	DE-9 Pin #	Signals / Directions	PC DE-9 Pin #	State	DE-9 Pin #	Signals / Directions	PC DB-25 Pin #
XX	1	DCD → DCD	1	HI	1	DCD → DCD	8
XX	2	TXD → RXD	2	XX	2	TXD → RXD	3
XX	3	RXD ← TXD	3	XX	3	RXD ← TXD	2
HI	4	DTR → DSR	4	HI	4	DTR → DSR	20
LO	5	GND ↔ GND	5	LO	5	GND ↔ GND	7
HI	6	DSR → DTR	6	HI	6	DSR → DTR	6
DC	7	RTS ← CTS	7	DC	7	RTS ← CTS	4
XX	8	CTS → RTS	8	XX	8	CTS → RTS	5
HI	9	+5V ↔ +5V	9	HI	9	+5V	-
DC = DO NOT CARE				XX = INDETERMINATE			

**Table 3-1 RS-232 Cable Configurations**

### 3.3.2 RS-232 Serial RJ-12

The printer is configured with a DB9 RS232 connector by default but may be also configured with the optional RJ12 connector. The figure below shows the wiring diagram of the RJ12 connection.



**Figure 3-3 RJ12 Serial Option Wiring**

## 3.4 USB Communication Interface

The printer's USB port may be configured in two different uses. The default configuration configures the USB as a CDC ACM which requires a driver to be installed on the host system. This driver is supported by both Windows and Linux operating systems through different drivers. The printer may also be configured as a USB HID device so no specific drivers need to be installed. Connecting the printer to the HOST system running Windows will install the printer.

### 3.4.1 USB HID

The printer may be configured as a USB HID device. Once the printer is configured as a USB HID (see Configuration Application), simply connecting the printer to a Windows Operating System will install the Microsoft driver.

Once the driver is installed and, communication with the printer may be done using software developed to send FGL instructions to the USB HID port.

### 3.4.2 USB CDC ACM

This is the default mode of the printer. Both Windows and Linux Operating Systems are supported through different driver installations.

#### 3.4.2.1 USB CDC ACM - Windows Installation

The device driver "Microcom\_USBCOM\_vx.xx.x\_xxxx-xx-x\_setup.exe" (the "x's" indicate the driver version and date code) is needed to install the USB CDC driver on a Windows Operating system by following the steps outlined below.

1. Run the driver installer mentioned above with ADMIN access on the host PC.
2. Go through the installation process. Connect the printer and turn the power on to complete the installation.
3. To verify the installation, go to the host PC Device Manager and expand the "Ports (COM & LPT) section. One of the COM port should display "Microcom 485 Thermal Printer". If it does not show up, disconnect the USB cable from the host and then reconnect the cable to reload the driver.

After the driver is installed, connect to the printer just like you would a standard serial port.

#### 3.4.2.2 USB CDC ACM - Linux Installation

The Linux host kernel must be configured so that the USB Modem CDC ACM) support is built as part of the kernel. This is typically included by default in most distributions. Please note that if *ModemManager* is installed and running on the Linux system, it will try to communicate with the printer and prevent other applications from properly communicating with the printer causing data loss. To see if *ModemManager* is running, run the "ps -e | grep ModemManager" command. If the program is listed as a running process, please look at your Linux distribution on how to disable the *ModemManager* or blacklist the Microcom 485 Thermal printer device so that it will not try to control the printer.

Follow the steps outlined below to install the USB CDC device on Linux Operating System.

1. Connect the printer to an available USB port on the Linux based host machine.
2. Power the printer.
3. Linux should automatically load and enumerate the device. To test this, run the command "dmesg | tail" and observe the output. It should be similar to the following:

```
> usb 1-1: new high-speed USB device number 2 using ehci_pci
> usb 1-1: new USB device found, idVendor=277d, idProduct=7001
```

```
> usb 1-1: new USB device strings: Mfr=1, Product=2, SerialNumber=0
> usb 1-1: Product: 485
> usb 1-1: Manufacturer: Microcom
> cdc_acm: 1-1:2.0: This device cannot do calls on its own. It is not a modem.
> cdc_acm: 1-1:2.0: ttyACM0: USB ACM device
> usbcore: registered new interface driver cdc_acm
> cdc_acm: USB Abstract Control Model driver for USB modems and ISDN adapters
```

4. As observed in the output of “dmesg”, the printer has been enumerated as “/dev/ttyACM0”. This would be the device path used to access the printer.

### 3.5 Host USB Interface

The Host USB connector on the rear panel of the printer is used for updating the printer’s application, Bootloader, and the fonts stored in the printer. Contact your Sales Representative for additional information.

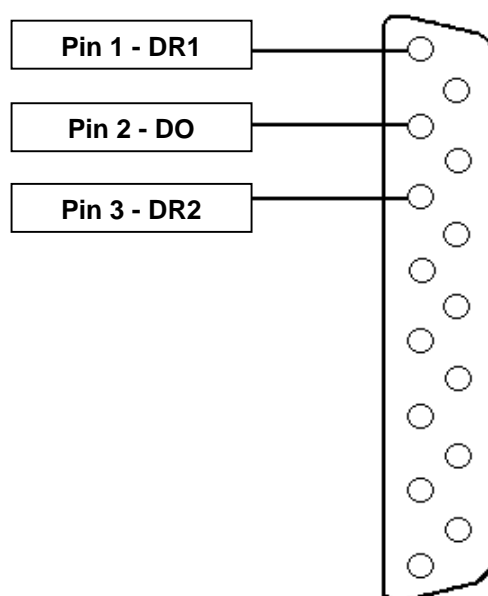
### 3.6 Ethernet Communication Interface

The printer is configured with a 10/100 BASE T Ethernet that is configured for DHCP out of the box. After one minute of idle time after a power up, if a connection is not established, the printer will switch to a static IP Address of 192.168.200.3 with a Subnet of 255.255.255.0 on port 9100.

The printer also has a resident Web Server running on IP 192.168.200.3 that may be used to configure the printer as well.

### 3.7 Cash Drawer Option

The printer provides a DB15 connector to support the use of 24v cash drawer applications. The Draw Kick-out solenoid current must be 1 amp or less to avoid current overloads. This option is only available when using the FGL Emulation mode.



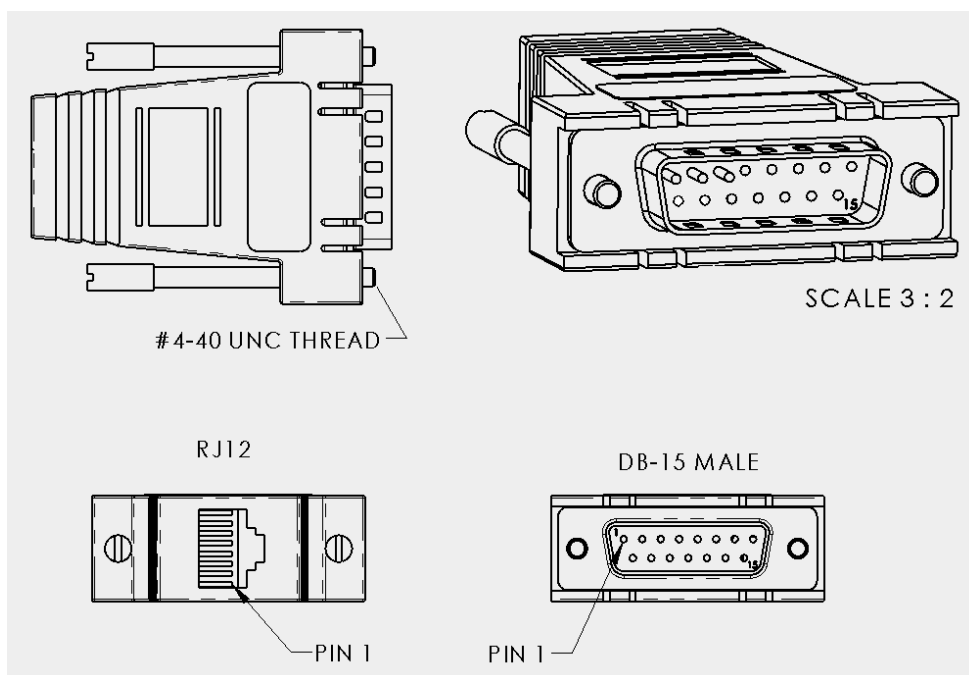
**Figure 3-4 Cash Drawer Pin-out**

### 3.7.1 Cash Drawer RJ12 Adapter Option

Some cash drawers may use a RJ12 connector instead of the DB15 connector. The RJ12 adapter (060437-1000) is available as an optional component for these applications.

RJ12	Wire Color	DB-15
1	WHITE	X
2	BLACK	1
3	RED	X
4	GREEN	2
5	YELLOW	3
6	BLUE	X

**Table 3-2 RJ12 Adapter Pin-out**



**Figure 3-5 Cash Drawer RJ12 Adapter**

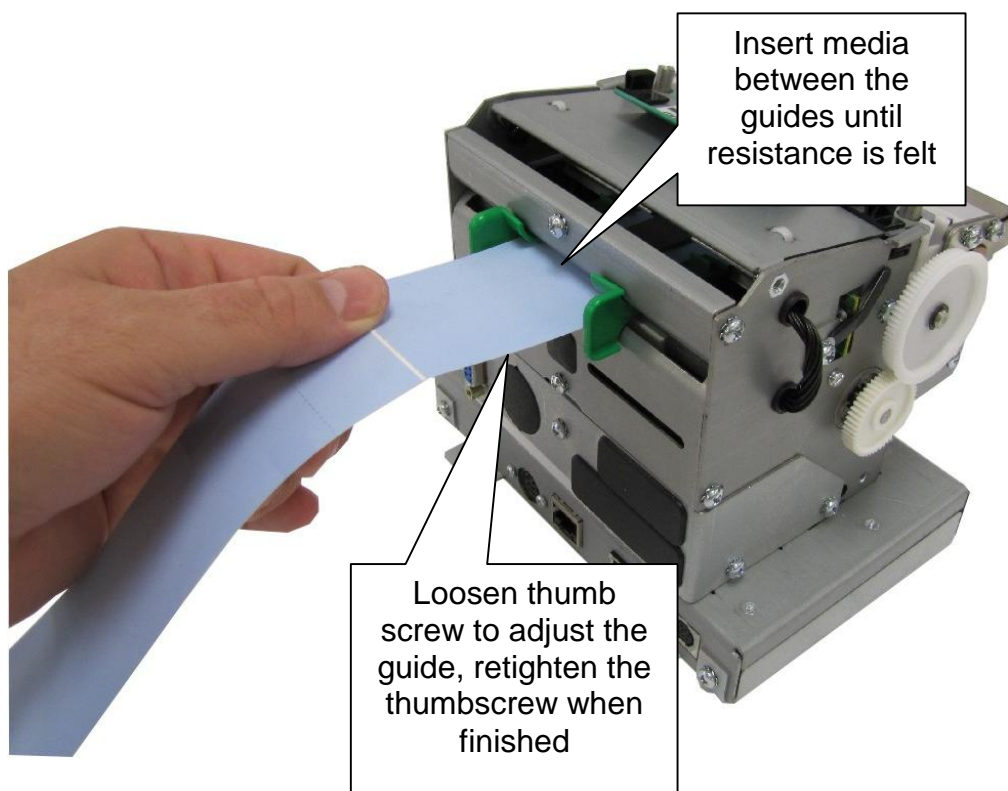
## 3.8 AUX Option

The AUX port option or auxiliary port on the printer is for custom application support and for optional sensor support.

### 3.9 Loading Media

Loading media into the printer is an easy process. Follow the instructions below to properly adjust the paper guides and load the media.

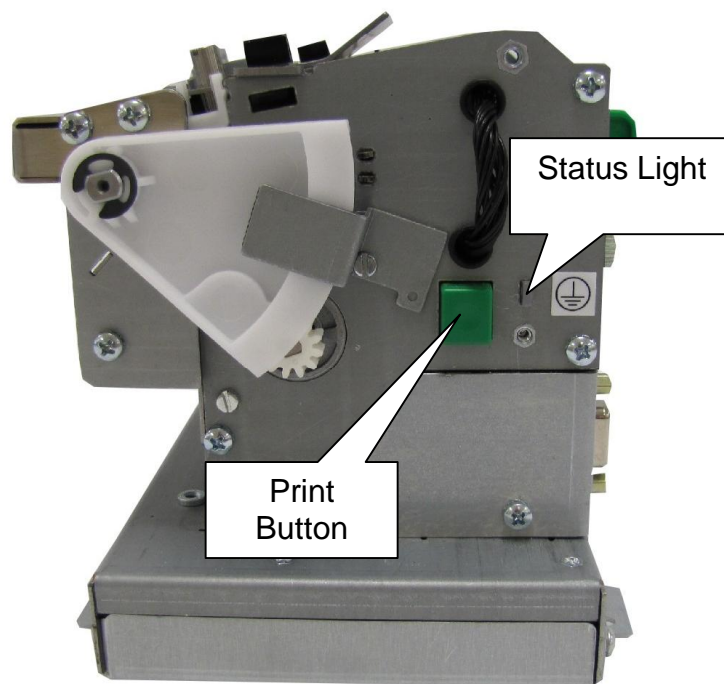
1. Loosen the green thumbscrew at the back of the printer to adjust the green media guides so that the media contacts both sides of the green guides.
2. Retighten the green thumbscrew once the guides have been adjusted.
3. Feed the media into the paper path, between the green guides, until you feel resistance.
4. Once the printer detects paper in the printer, it will automatically feed and align the paper so that it is properly positioned.
5. If the Autoload feature is disabled, you may also manually feed the paper through the printer by lifting the print head release at the top of the printer and feeding the paper through the printer.
6. Also, if the print button is pushed and held, the printer will manually feed the media through the printer.
7. Once the media exits the front of the printer, release the Print Button.



**Figure 3-6 Loading Media**

### 3.10 Print Button and Status Indicator Light

The Print Button and the Status Indicator Light are used to identify and perform many functions. This section provides a description to familiarize you with the basic function of the Print Button and the Status Indicator Light.



**Figure 3-7 Print Button and Status Indicator Light**

#### 3.10.1 Print Button

<i>Operation</i>	<i>Description</i>
Button Press	A button press is used to generate a Test Ticket and to clear errors.
Double Press	Pressing the button twice in Graphics mode will cause the Test Ticket to print
Button Pressed and Held In	Pressing and holding the button in will cause a line feed in certain language modes.

**Table 3-3 Print Button Description**

### 3.10.2 Status Indicator Light

Light Color	Description
Solid Green	Indicates that the power is on and the printer is in a ready state.
Solid Red	Indicates an error has occurred. The printer will remain in this state until the condition is removed. If an unexplained error persists, contact your Service Representative.
Solid Amber	Indicates that the printer is in the Boot Loader mode (MCB) and is not running the printer application program.
Flashing Red	A cutter error has occurred. OR A memory download operation was not successful. OR Power Spike or low voltage on the AC line. (The printer will remain in this mode until the condition is removed and the printer power is cycled.)

**Table 3-4 Status Indicator Light Description**

## 3.11 Printer Modes

The printer has three primary modes of operation. The different types of modes have an impact on how the Print Button and the Status Indicator Light operate. This section is intended to provide the user with an explanation of these different modes.

### 3.11.1 Ready Mode: GREEN

The printer is in the READY Mode when it is ready to print or has no pending activity. The indicator light is GREEN, which indicates that the printer is ready to receive label formats and/or commands.

Pressing the print button while in this mode generates a test ticket that contains setup information about the printer. It is helpful to determine what mode it is in, what communication port is active, and general operational details/

### 3.11.2 Halted Mode: RED

The printer is in the HALTED Mode when it has stopped due to an error condition. The Status Indicator Light will be solid red in color when the printer has entered the HALTED Mode. The printer will remain in this mode until the error has been corrected and cleared. Once the error has been cleared, the printer will return to the Ready mode.

Pressing the button in this mode will cause the printer to attempt to clear the error and return the printer to Ready mode.

### 3.11.3 Diagnostic Mode


The Diagnostic Mode temporarily powers up the printer using factory default parameters. Also, the printer's current user configuration parameters and statistical information are printed out on a Status Label. This provides useful information to help diagnose and troubleshoot problems. The printer will use the factory default parameters until the printer has been reset using a soft reset or by cycling power. The printer will then return to the configuration shown on the Status Label.

#### 3.11.3.1 Entering Diagnostic Mode

To enter the Diagnostic Mode, press and hold the Print Button "IN" while turning the printer "ON." Release the Print Button after printer light changes to green. The printer will enter the DIAGNOSTICS Mode, and print the Statistics label and a print test pattern.

#### 3.11.3.2 Statistics Label

The Statistics Label may be printed by entering the DIAGNOSTICS Mode.



```

WIFI Broadcast ESSID:
> MCOM-WiFi
WIFI MODE:
> ACCESS POINT
WIFI DHCP ON
-----
WIFI SUBNET:
> 0.0.0.0
WIFI MAC:
> 00:00:00:00:00:00
WIFI PORT:
> 1235
WIFI IP:
> NO ADAPTER
-----
WIFI ENABLED
ETH DHCP ON
ETH GW:
> 0.0.0.0
ETH SUBNET:
> 255.255.255.0
ETH MAC:
> 00:14:2d:2c:1a:7c
ETH PORT:
> 9100
ETH IP:
> 192.168.200.3
ETH ENABLED
Model:
> Model 485TC
Serial Param:
> 115200,N,8,1
Head DPI (dots):
> 300
Head Size (dots):
> 1280
LangMode:
> 3
Code Ver:
> 01.00.08
Serial #
> 01033427007
Srvc Pwr On (hrs) :
> 2
Srvc Prntd Lbls :
> 4
Lf Prntd Lbls:
> 4
Lf Pwr On (hrs):
> 2

DIAGNOSTICS
LABEL
MICROCOM CORP.
(740)548-6262
  
```

**Figure 3-8 Statistics Label Example**



### 3.11.3.3 Test Ticket

The test ticket does not require that the printer be in the Diagnostics mode but it extremely useful while troubleshooting the printer if problems arise. To generate a Test Ticket, simply press the button and the test ticket prints out.

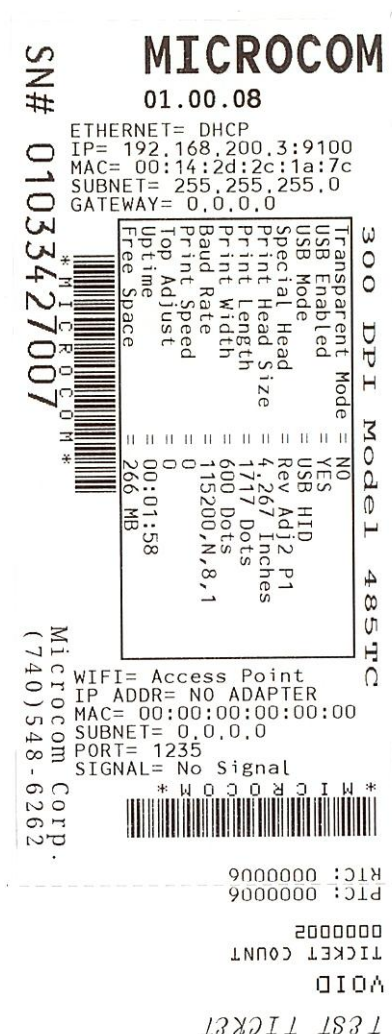
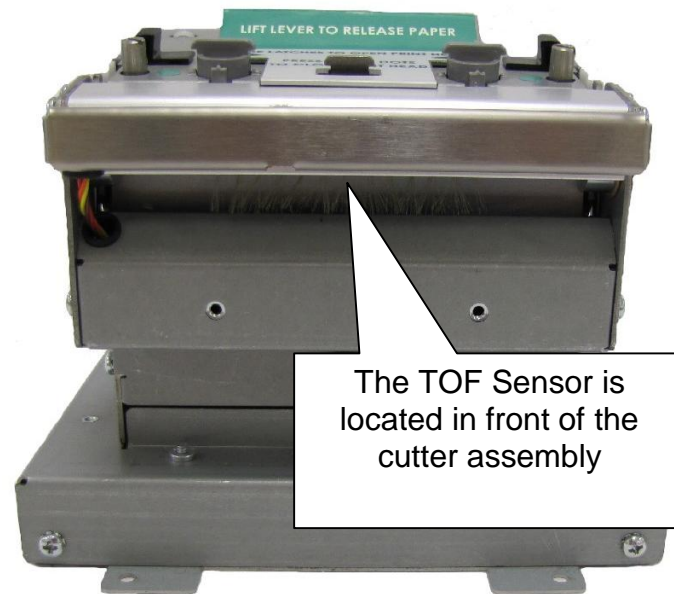


Figure 3-9 Test Ticket Example

### 3.12 TOF Sensor

The TOF Sensor is used to detect when media is present and is used in conjunction with the Top-Of-Form operation. A TOF is when the printer uses the sensor to detect the edge of the media and retracts the configured distance. See the D121 and D123 commands for more details regarding the TOF operation.

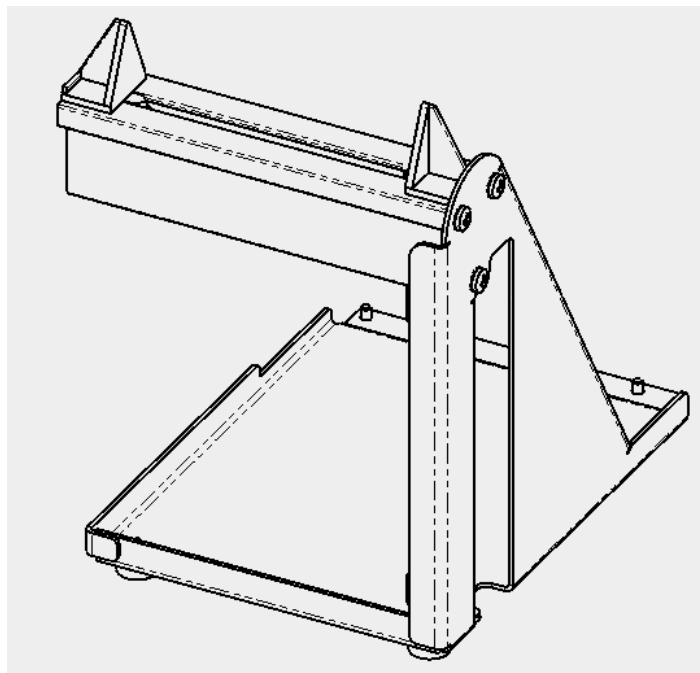
A potentiometer adjusts the distance over which the LPD sensor will detect reflections. The maximum range may be adjusted over a distance of 0.20" to 0.85". Distances are measured from the surface of the sensor to the reflecting surface. The sensor is set to the maximum detection at the factory. This pot may be used to decrease sensor range to avoid false reflections from stationary objects such as a cutter.



**Figure 3-10 TOF (Top-Of-Form) Sensor**

### 3.13 Media Roll Holder Option

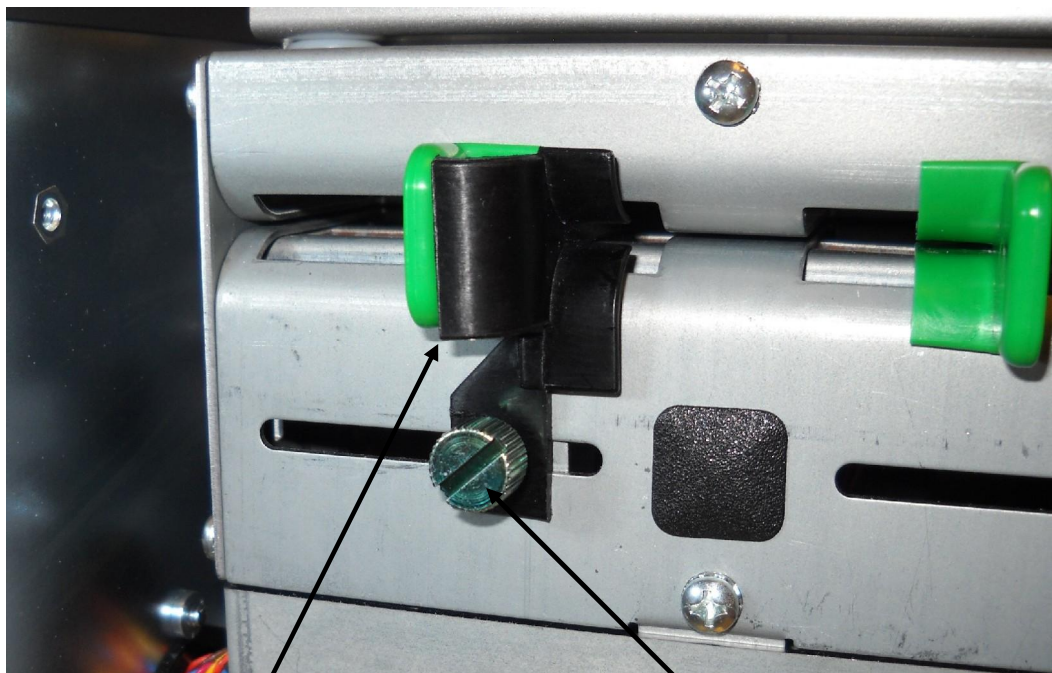
The printer may be configured with an optional media holder for media wound on rolls. The holder is designed to hold media cores of 1.5" or larger and contains media guides intended to help prevent unnecessary unwinding of media.



**Figure 3-11 Rolled Media Holder**

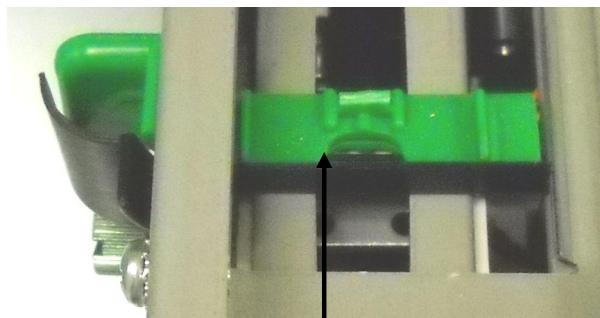
### 3.14 Wristband Media Adapter Option

When 1" wide wristband media is being used, the wristband option should be installed. The wristband guide is inserted into the media guide and is locked into place.



Wristband Guide

Loosen locking nut and  
slide guide into place  
and retighten into place



Insert into media guide  
making sure that it is  
flush against the green  
media guide

**Figure 3-12 Wristband Media Adapter**

### 3.15 Printer Integration

When designing a kiosk, it is important to consider how the printer will be used, operated, serviced, integrated with other kiosk components, and integrated into the enclosure itself. The printer has some basic requirements in order to operate reliably for years. The printer has some basic requirements in order to operate properly for years. Microcom has a staff that is committed to helping integrate our products. We will do as much as needed to ensure that the process goes correctly and smoothly. Reference documents, 3D CAD files and drawings can be provided.

The general issues are:

- Only trained personnel should have access to, operate, or service the printer.
- Dispense position of the media, top, front or dropped into a tub.
- Mounting of the printer to the kiosk.
- Printer Power Requirements.
- Interface between the host computer and the printer.
- Media Handling – The design of the kiosk should consider the type of media to be used: roll or fan-fold media; the appropriate media dispensing system; the location of the media in the kiosk relative to the printer; and the overall size of the media package (roll diameter or stack height).
- Operator access for loading, cleaning and service.
- The printer's user interface for status lights and also access to view and press the feed button while observing the status light for media loading, setup, and servicing the printer.
- Space to open, clean the print head or remove jams and replace the print head.
- The media path between the printer and media (roll or fan-fold).
- Access to the mounting hardware in order to service or replace the printer.
- Ambient Lighting and external light sources which can affect printer's behavior.
- Keeping the printer cool and free from dust.

#### 3.15.1 Environmental Considerations

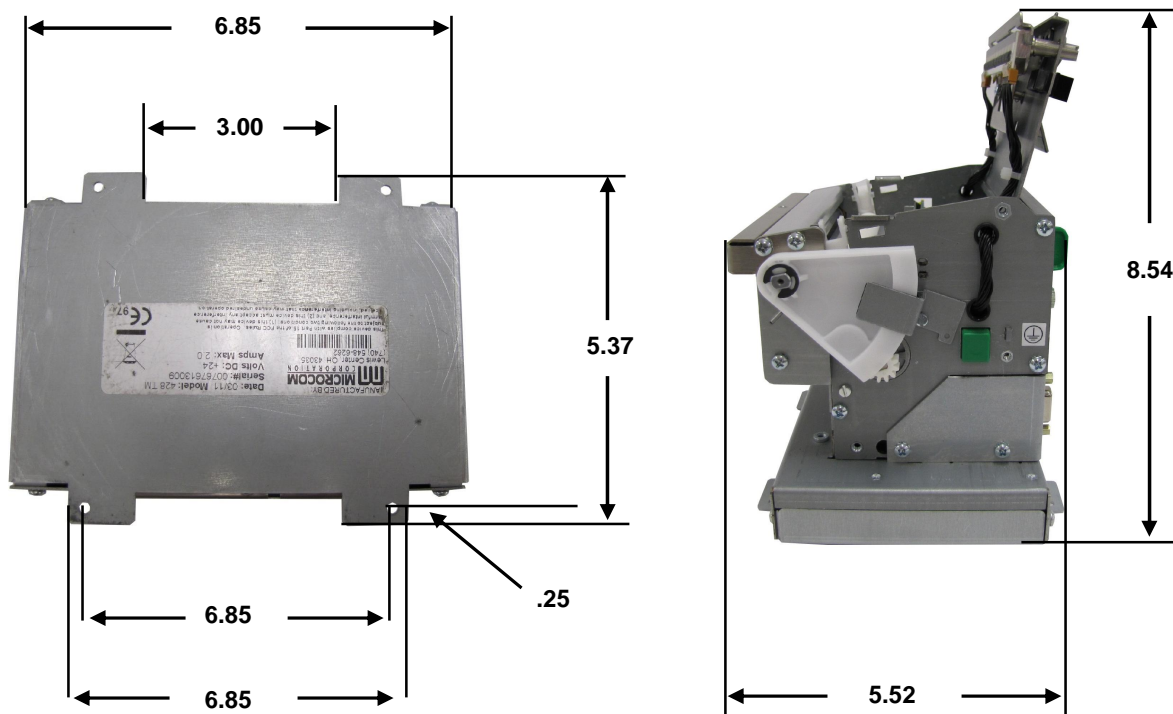
Unless specified differently in the operator's manual or in the product specification sheet, the operating environment for Microcom printers is listed below.

- Relative humidity: 10-85% non-condensing
- Operation Temperature: 40° to 104° F (5° to 40° C)

#### 3.15.2 Printer Mounting Orientations

The printer can be mounted horizontally or vertically, both up dispensing and down dispensing, depending on the design of the kiosk. Environmental conditions that may affect operation: Humidity, temperature, air circulation air in the kiosk, and static buildup on adjacent kiosk components and surfaces, etc. Media considerations: Paper length, partial or full cut, curl at the end of the media roll, thickness and weight, perforations on fan-fold media, etc. Other considerations: Media mounting, media path, media access, printer maintenance, cabling, etc.

It is recommended; when the designer wants the media to fall clear of the printer when cut, that the printer be mounted vertically and the use of static prevention are used. See the Electrostatic Discharges section later in the guide.



**Figure 3-13 Printer Dimensions**

### 3.15.3 Media Mounting Considerations

The printer uses direct thermal media which is chemically treated to react to heat.

The printer has several basic requirements for running the media to the printer from a roll or fan-fold media which include:

The printer uses direct thermal media which has been chemically treated to react to heat. The printer has some basic requirements for the media to run successfully through the printer.

- The centerline of the media roll or fan-fold stack should align with the center of the printer's paper path to provide the best tracking of the media and reduce media damage. A media guide is required for printing accurately and consistently.
- Do not blow air onto the media. Air should be pulled from the kiosk to keep out dust (which shortens print head life and affects print quality) and chemicals (such as cleaning solutions like ammonia or bleach). Air flow within the kiosk should not pull exhaust heat from other kiosk components and power supplies across the media or printer.
- Avoid direct sunlight, incandescent or infrared lighting or heat sources. These light sources can come from openings in the kiosk and other kiosk components. Incandescent light bulbs, sun light and heat sinks are examples of heat sources that shouldn't be near the printer or media.
- The media path must be smooth and not cause excessive drag. It should be clear of cables, other kiosk components, or surfaces other than media guides, supply holders or the fan-fold media tray. Roll media must be able to turn with minimal resistance and allow the printer to smoothly pull media without jerking or snagging. Minimize friction with the roll holder contact and avoid sharp corners in the media path. Larger, heavier media rolls are

more susceptible to these issues. Fan-fold media must have sufficient room to unfold and not bind on media guides, tray surfaces or media perforations. An improper media path can produce a compressed print, slipping, and jamming which can occur more frequently as the printer ages.

### **3.15.4 Designing a Roll Support**

Media roll supports may be purchased from Microcom. If you are designing a custom roll support, please be aware of the following design guidelines.

- Implement a simple design which allows the media to be gently placed in the kiosk.
- Minimize the drive train load caused by the media supply. Do not use wires, cables or rods as a roll holder - all of these can cause the roll to stop and start and rock back and forth. The inside of the roll core should be smooth and free from dust. The larger the roll, the greater the effect it has on drag and possible slipping.
- The spindle used inside the core should be sized properly so that it doesn't fit tight or cause the core to rock on the spindle. A good rule is to make the spindle at least .05" smaller than the inside diameter of the core.
- Leave plenty of access room to load media when designing the area for your roll holder.

### **3.15.5 Designing for Fan-Fold Media**

Fan-fold media must be handled correctly. When it unfolds, it can get caught and the stack may fall into other components and cabling. Make a tray to hold the fan-fold media. This tray could be the box that fits into a shoe provided by the stock converter. Always test and observe the media for these types of problems. Fan-fold media can un-fold differently at the beginning and end of the stack. This stock can also stick to itself because of the perforations. Choose a stock converter with experience with this process. The media stack should never be able to be pulled into the back of the printer. When using fan-fold stock, the stack should be located back from the printer far enough to allow the media to unfold prior to entering the back of the printer to prevent it from jamming. Once again, the fan-fold media should be in proper alignment with the paper path of the printer. This misalignment can cause jamming or the print image not to appear correctly on the stock.

### **3.15.6 Designing Media Guides**

The media guides need to have a minimum radius of .5". The surface should be smooth and not touch the edges of the media (causes drag or edge damage). They need to be in alignment with the printer and the supply holder. Additional guides to ensure the paper tracks straight may be necessary. These guides should be sized properly to ensure tracking without damage to the stock. Check with the stock converter for the proper tolerance and then size the left and right guides for some clearance over their maximum width. It is recommended that a minimum of 1.5" long guides be used to ensure the stock doesn't fold over on itself or tear. These guides could also be used to keep cables away from the media.

#### **3.15.6.1 Designing the Media Dispense Path**

Properly dispensing the media from the printer is critical to the operation of the printer and quality print.

- The media dispense chute should always be wider than the maximum width stock for the printer being used.
- Upon exiting the printer, the media should never be forced or bent as this will cause jamming.
- The stock should never be expected to drop through a chute as this may be unlikely due to electrostatic discharge as covered later in this document.
- The exit chute should act as a funnel and always be larger than the dispense point.
- Never allow the user to grab the printed media prior to the cut operation as this could cause jamming or stretched print. The use of a presenter or drop tub is recommended. Guides specific to a fixed length can also be designed.

#### **3.15.6.2 Cables and Routing**

Always use cable ties and locking connectors if possible, allow for kiosk component servicing, and avoid electrical noise sources.

- Cables that are near the printer, media path, or media should be tied to the kiosk chassis or printer mounting hardware. The operator can accidentally disconnect the printer or other kiosk components when maintaining the kiosk. Cabling must not interfere with the proper operation of the printer and media. The operator can become caught on cabling and drop heavy media damaging the kiosk, printer, or hurting themselves.
- Service Loops - There should be enough slack in the cabling to not put pressure on the cable connectors or the circuit boards. Enough slack is needed to disconnect the printer (or their kiosk components) for servicing. Allow for movement needed to access the cable locks or slide the printer out.
- Avoid electrical noise sources: fluorescent lighting and ballast, power supplies, fans, AC power lines, CRT monitors, etc.
- Avoid twisting power and communication cables together. This can cause electrical noise on the communication port or raise emissions levels.

#### **3.15.7 Power Supply Requirements**

Thermal printers have special power requirements to operate correctly and safely within compliance regulation guidelines. To achieve optimum performance, an approved power supply should be used. Power supplies sold by Microcom Corporation have gone through rigorous testing to ensure the proper function of the printer. If a non-Microcom supplied power supply is used with the printer, it must comply with the requirements of that printer. The same ground **MUST** be used for the printer, printer power supply, and any device (PC, USB hub, etc.) connected to the printer communication ports, and the same AC power circuit should be used whenever possible for these devices. If the printer does not have an integrated power switch, it is recommended that the power supply have one on the ac input side to the power supply. Plugging and unplugging the 24 volt supply into the back of the printer hot can cause damage to the printer. Using an insufficient power supply can cause damage to the printer. Thermal printers require high over current peaks of power that must be handled by the power supply. When Short Circuit Protection or Over Current Protection



is activated, the power supply should shutdown automatically. Once the abnormal condition resulting in the failure is removed, the power supply should restart accordingly. If over Voltage Protection is activated, the power supply will shut down. The power supply should be fully protected against short circuits and automatically recover gracefully.

The output circuits (USB, Serial) may not be power limited. Equipment connected to these output connectors shall be of the certified type with their own fire enclosure. If a non-Microcom Corporation supplied power supply is used, it shall be of the certified type and a limited Power Source.

***It is highly recommended that Microcom provide the power supply in order to prevent damage to the printer or cause the printer not to function properly.***

### 3.15.8 Electrostatic Discharges and Ground Connections

The printer should have a dedicated earth ground connection. Preventing ESD and earth currents from affecting the printers operation requires proper connection to the printer chassis via a 12 AWG wire to earth ground. The ground wire should be connected to the printer chassis using a closed loop connector. Measure the resistance with an ohm meter to ensure proper grounding.

The same ground MUST be used for the printer, printer power supply, and any device (PC, USB hub, etc.) connected to the printer USB or serial ports. The same AC power circuit ground location should be used whenever possible for these devices.

If the printer is in a low humidity environment, the use of anti static brushes or tinsel may be required.

Electrostatic discharges can cause damage to the print head, memory or electronics. This damage will manifest itself as lost pixels on the print head, memory scrambling, communication to the printer lost or other issues causing the printer not to function properly. This damage can be immediate or happen over time.

When working with the USB port, it is imperative that ESD and Ground connections are adhered to or potential disconnect issues may be encountered. We also recommend disabling the ability to allow the computer to turn off the USB device under the Power management.

Example:

1. Open the system Device Manager.
2. Scroll to the Universal Serial Bus Controllers and expand the listing.
3. Open the USB Root Hub's listed (not the USB 2.0 Root Hub's).
4. Go to the Power Management tab under the Properties.
5. Uncheck the "Allow the computer to turn off this device to save power".
6. Select OK and repeat for the remaining USB hubs.



## 3.16 Qualsoft Windows Driver

### 3.16.1 Installing the Windows Driver

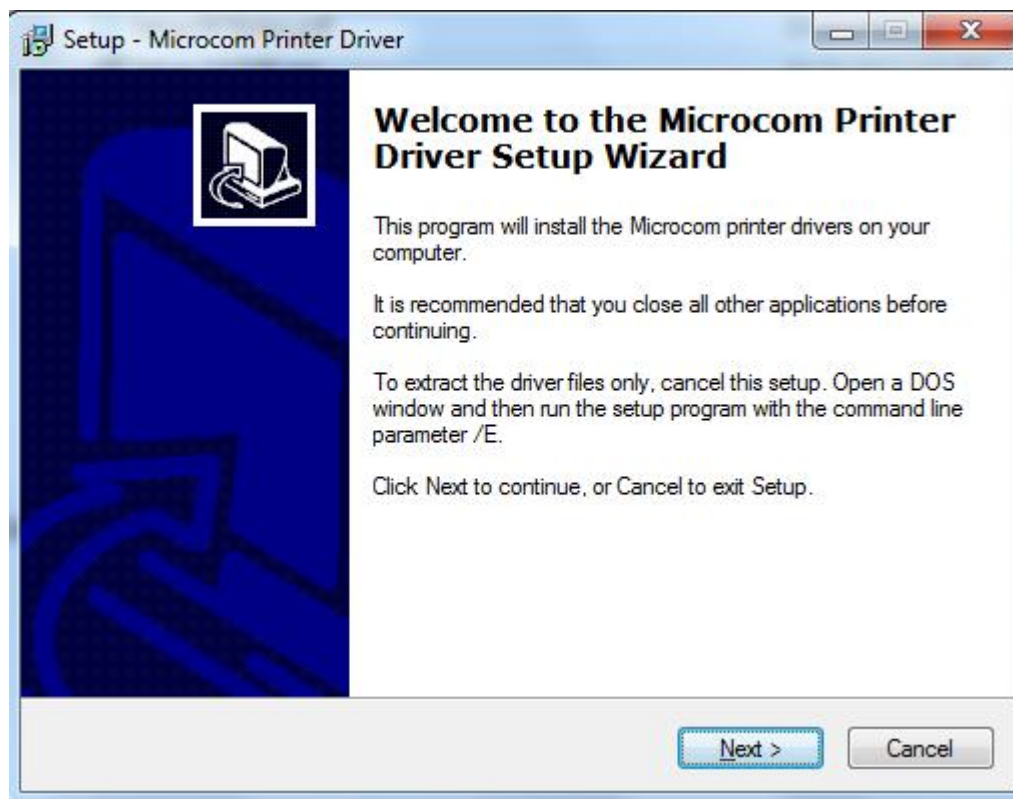
This section explains the driver installation process. The Qualsoft Windows print driver may be used with Windows 7, 8.1, and 10 operating systems. If the printer is intended to be used on a USB connection, the appropriate USB driver must be installed before the printer is able to be used with the driver. The X38 based products use an FTDI based driver while the X85 based products use a Microcom Corporation based driver.

The driver requires that the User has ADMIN privileges in order to install the driver. The installation process sample shows the Windows 7 installation.

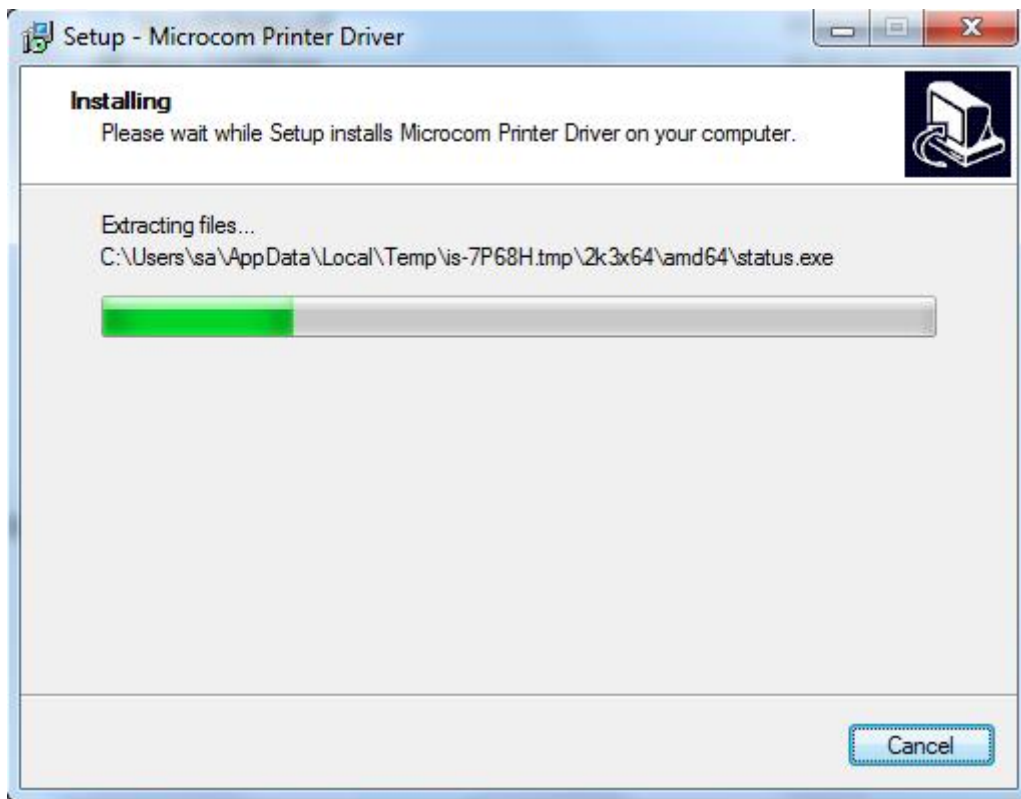
1. Right click on the installer, and select “Run as administrator”.



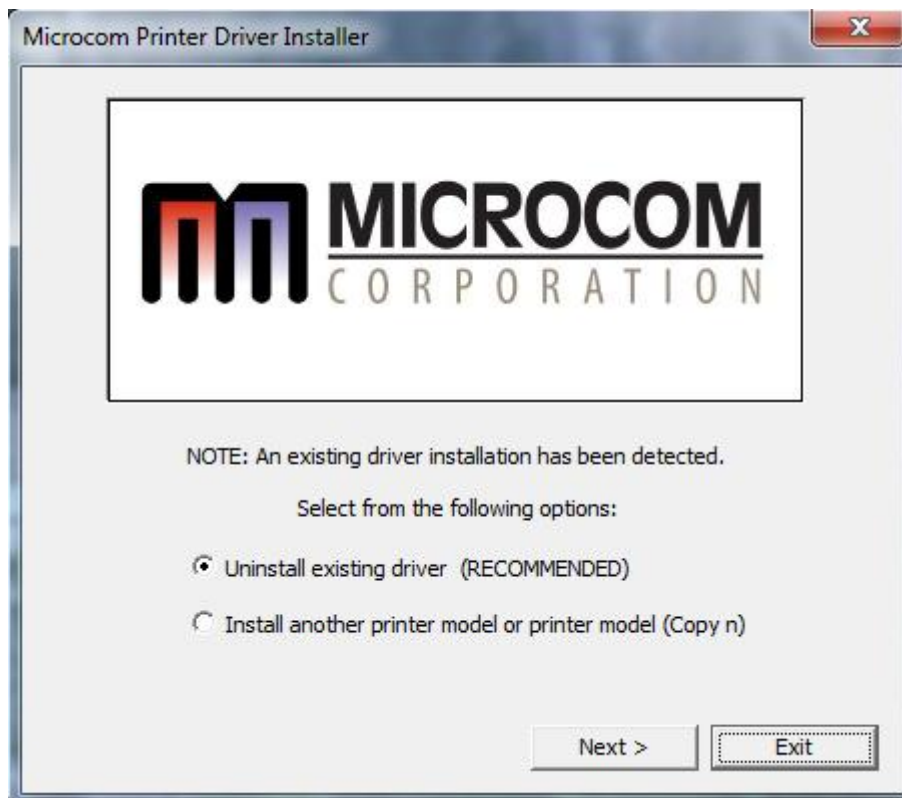
2. Click the “Next” to continue the installation.



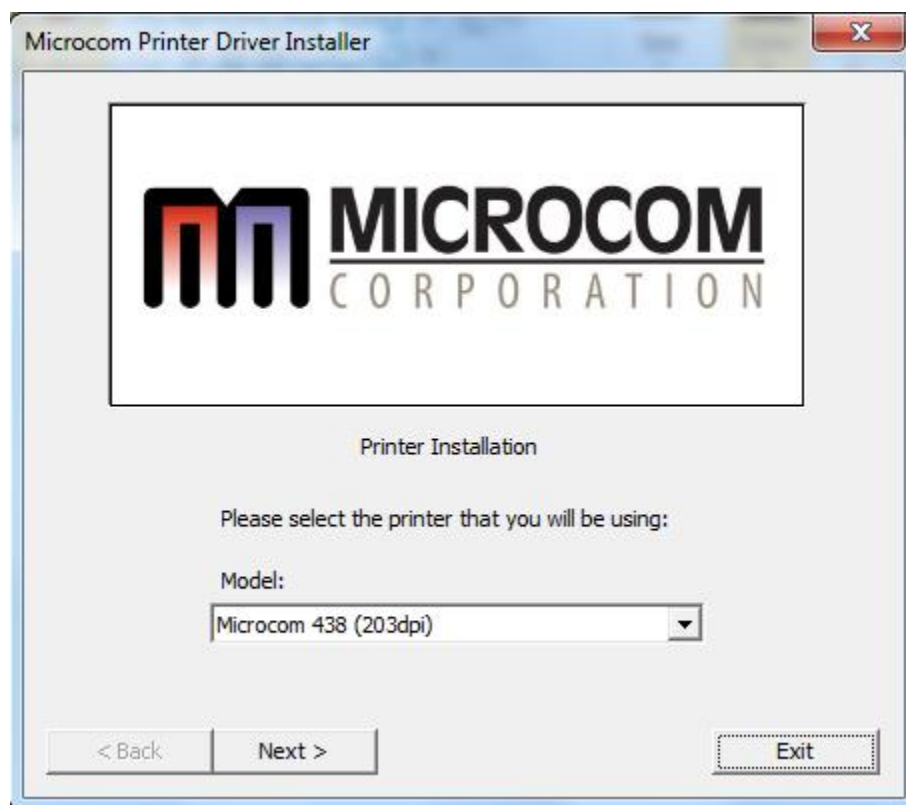
3. Wait for the installer to finish setting up the driver files.



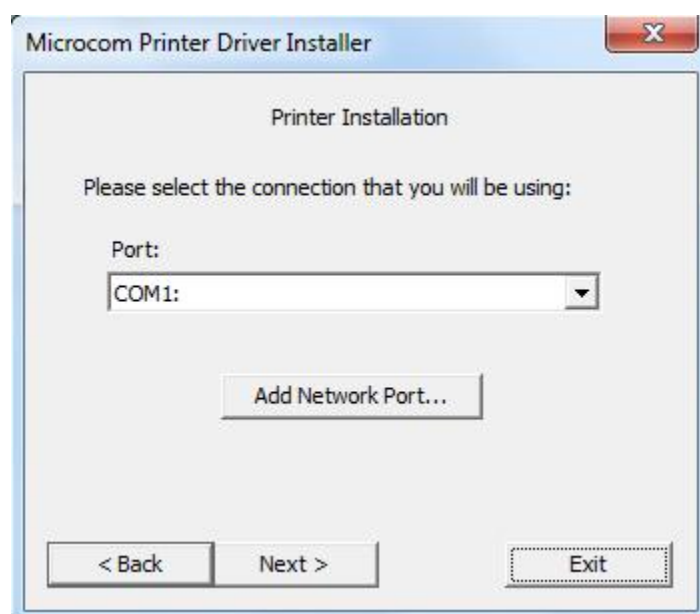
4. Select the New install or Uninstall existing driver if already running a Qualsoft version or if installing more than one printer, select the Install another printer model (Copy n).



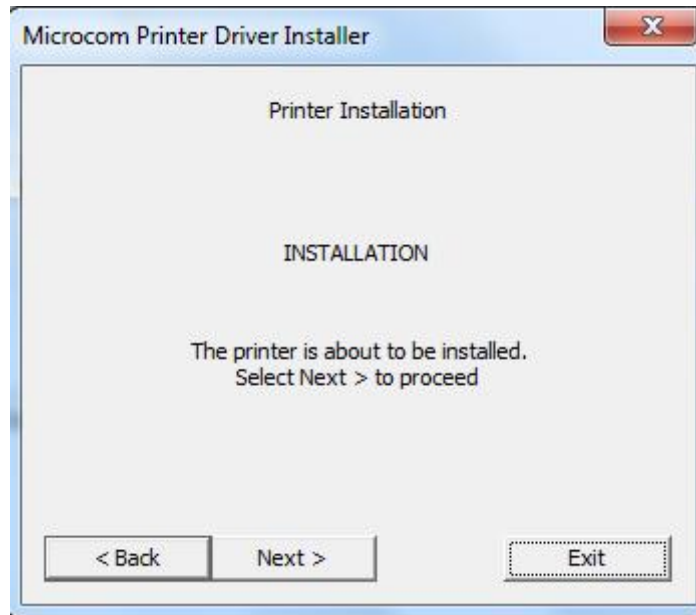
5. Select the Model number of the printer being installed.



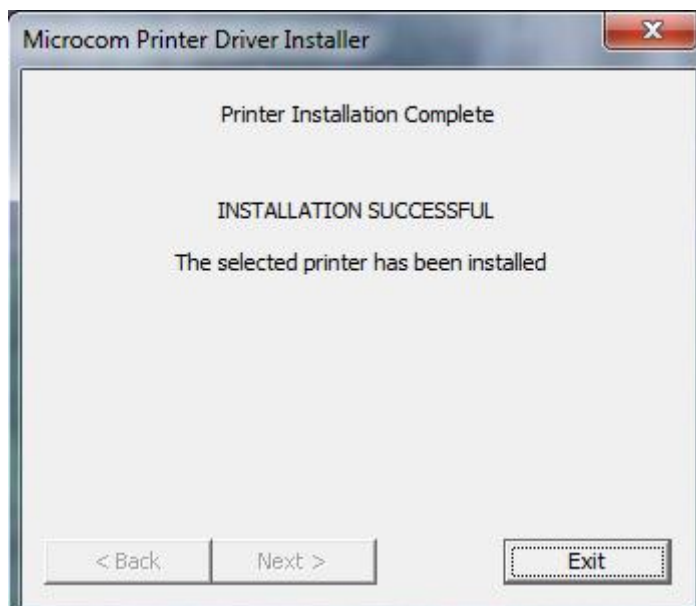
6. Select the communication port that is going to be used with the printer.



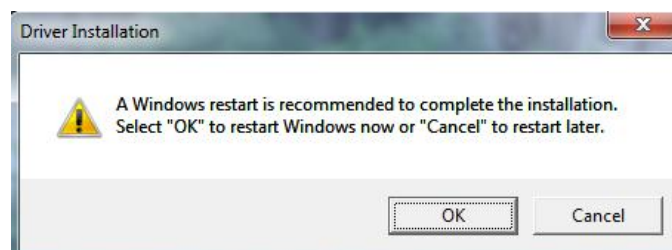
7. Select next to start the installation.



8. Once the installation is complete, select “Exit” to finish the installation.

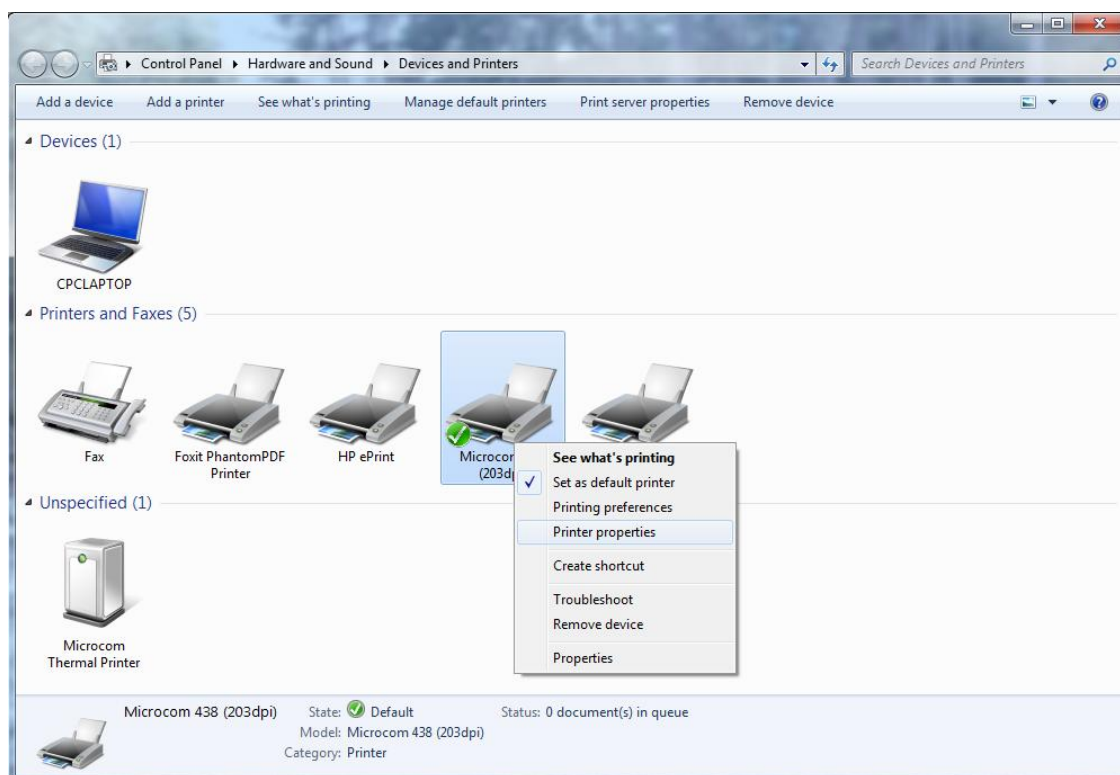


9. Select “OK” if prompted to restart and complete the installation.



### 3.16.2 Configuring the Driver

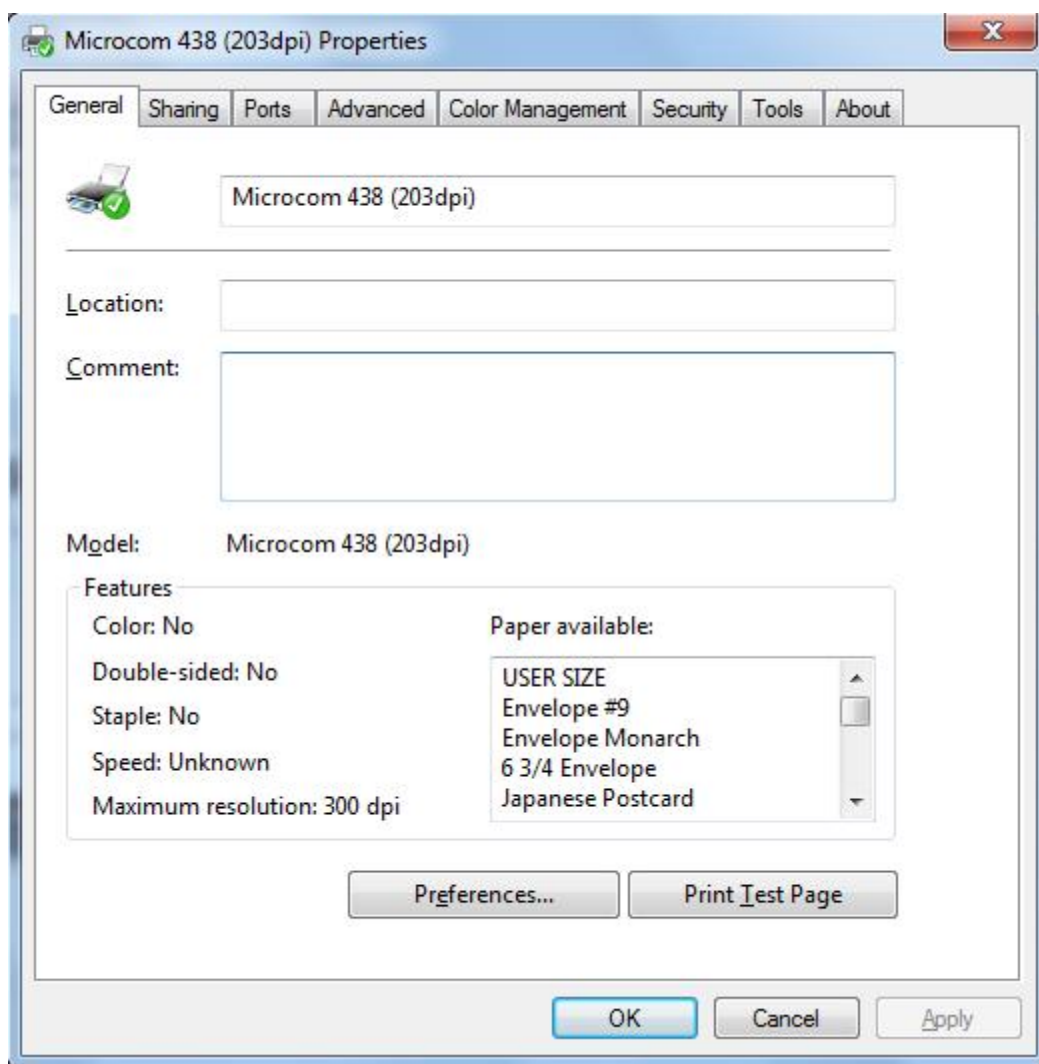
This section will explain how to configure the Windows Driver for proper operation. The example below also shows a Microcom Thermal Printer under Unspecified devices. This is the USB driver that is loaded when the printer is powered on and the printer USB port is connected to the printer.



Under Devices and Printers, you should see the printer model that was installed. Right click on the icon and select Printer properties to setup and to change the driver settings.

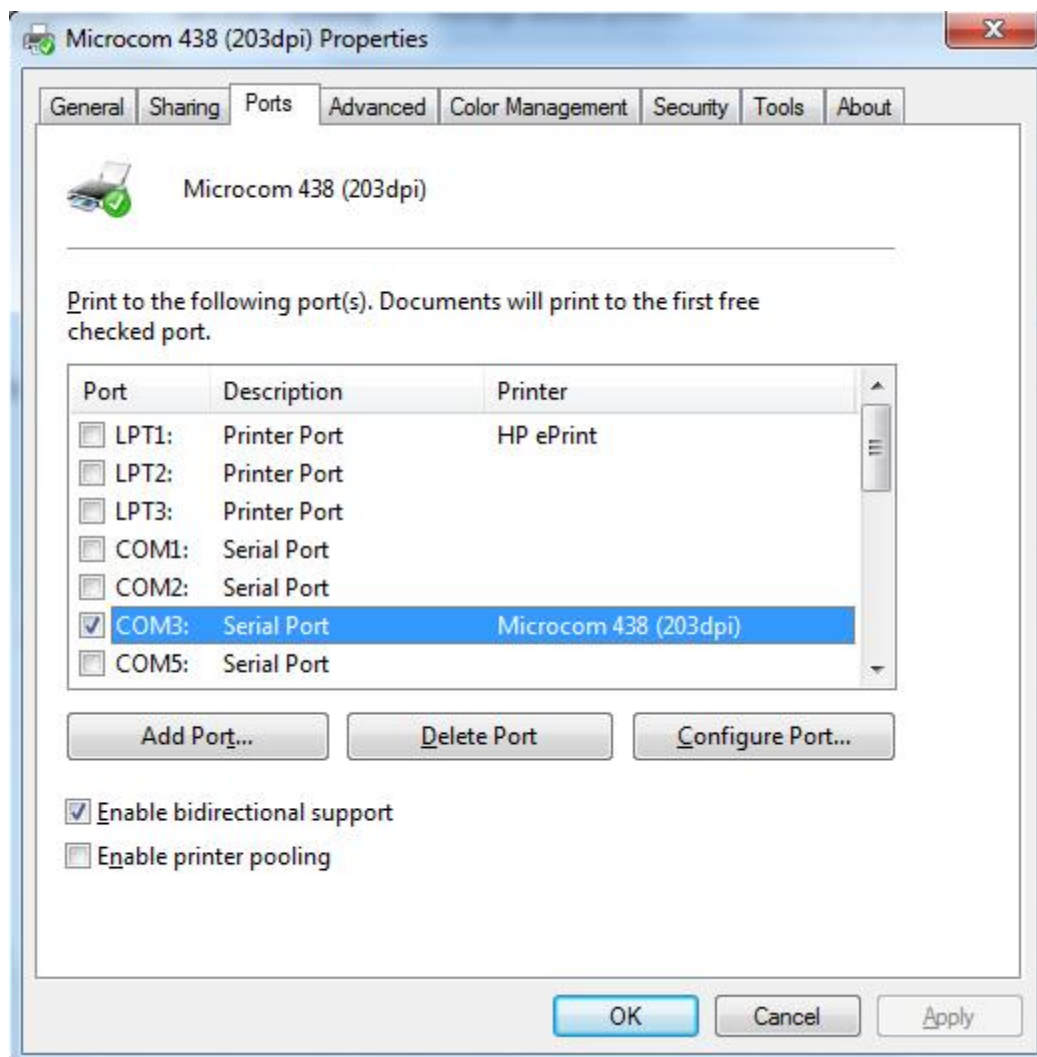
### 3.16.3 Printer Properties Page - General tab

This opens the printer properties page. From this screen, Print Test Page may be selected to generate a test page that is sent to the printer. The test page is printed on the media size and type that are specified in the driver preferences.



### 3.16.4 Printer Properties Page - Ports tab

Selecting the Ports tab at the top allows the printer port to be changed if connecting to a different printer communication port.





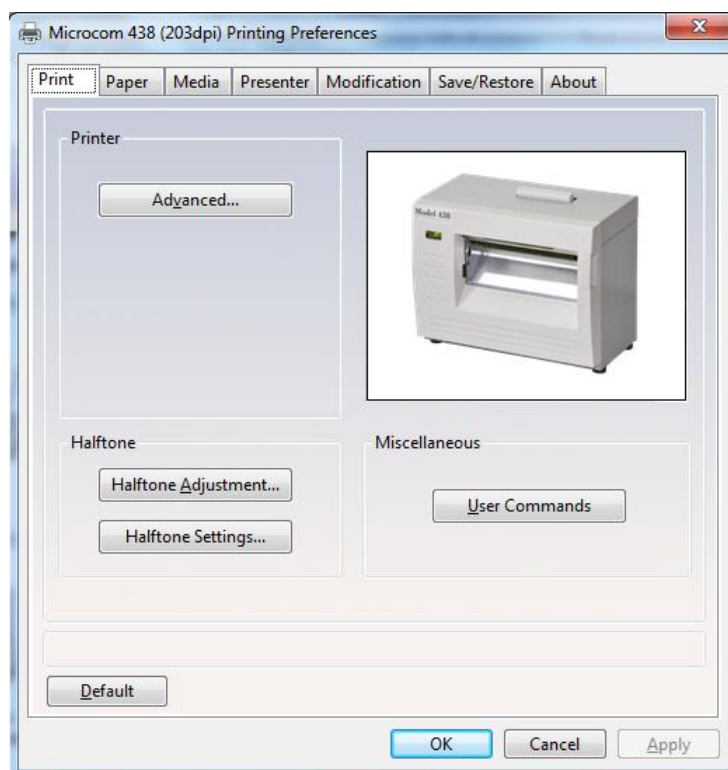
### 3.16.5 Printing Preferences - About tab

Selecting the Preferences icon at the bottom left of the Printing properties window opens the driver “About” tab. This shows the driver version number and release date.



### 3.16.6 Printing Preferences - Print tab

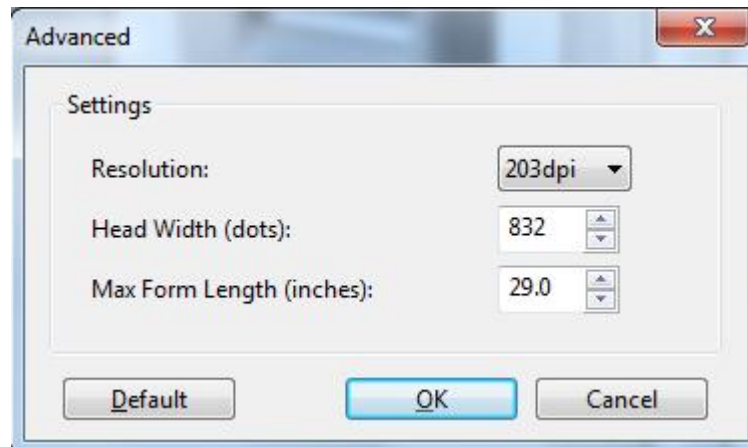
The Print tab shows the available options that may be set. Typically, these are already set for proper operation and do not need to be adjusted.





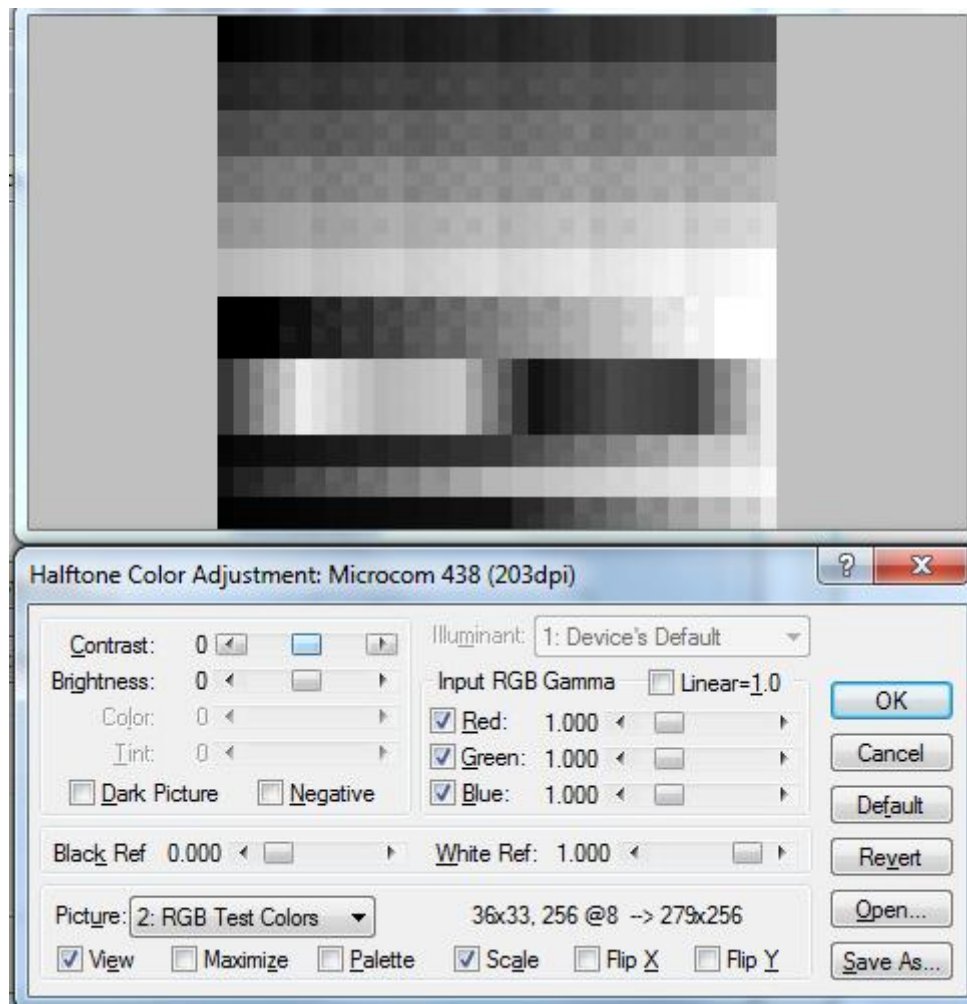
### 3.16.6.1 Print tab - Advanced

The Advanced tab is used to specify the print resolution and the printhead width. This tab is automatically set when selecting the printer model to install and should be ignored. This screen is typically used for development testing and custom solutions.



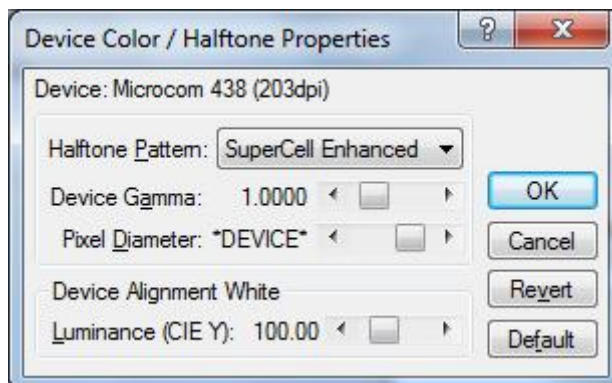
### 3.16.7 Print tab - Halftone Adjustment

The Halftone Adjustment icon opens the dialog windows below. This allows the user to manipulate the image settings that the driver uses to produce images.



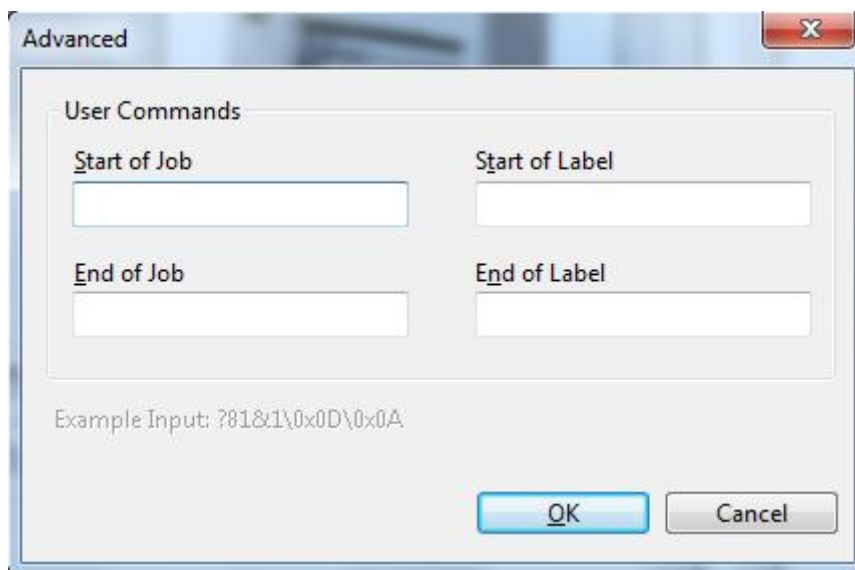
### 3.16.8 Print tab - Halftone Properties

The Halftone Properties page allows for dithering options and additional image manipulation to alter the image that is produced and printed.



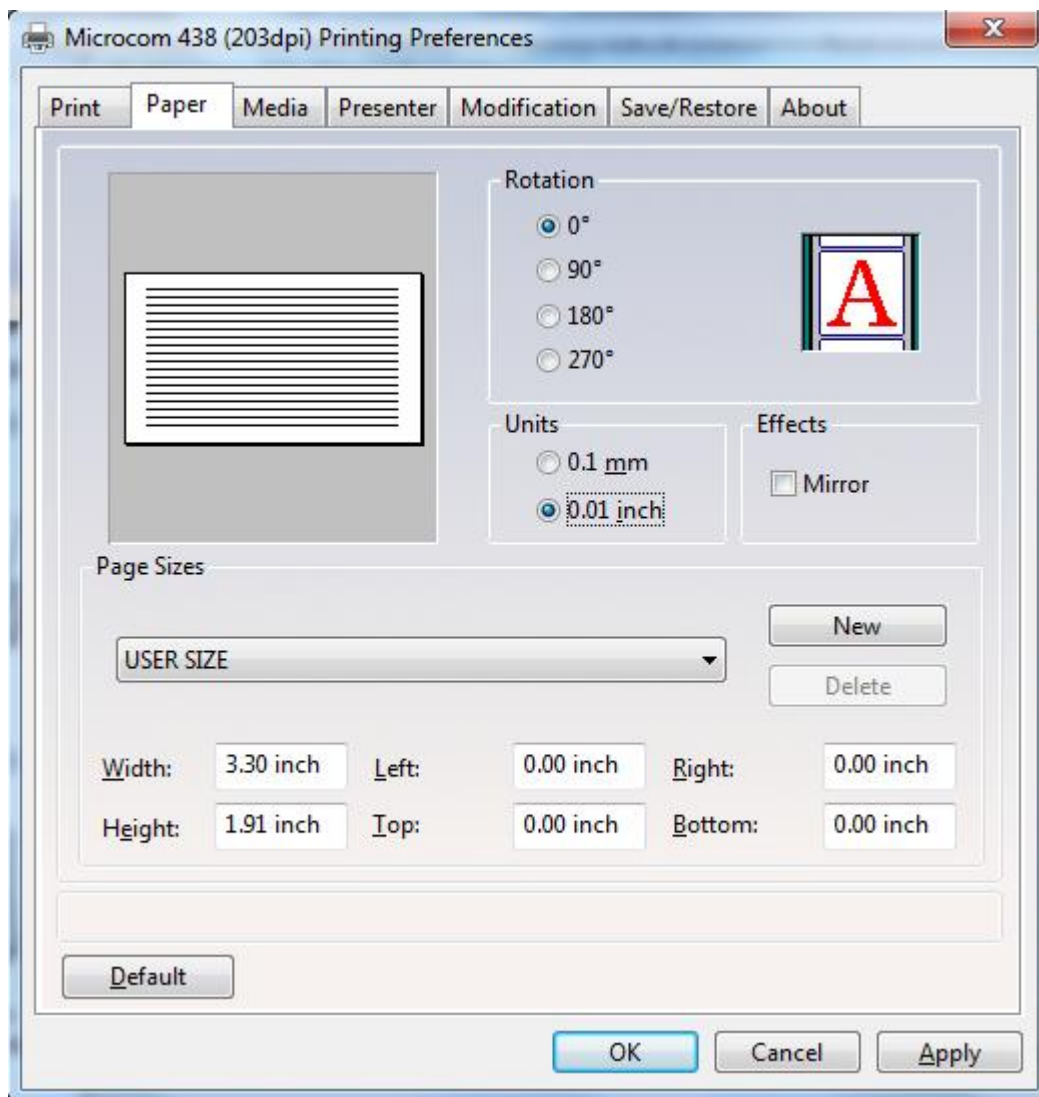
### 3.16.9 Print tab - User Commands

The User commands tab allows for the user to pass printer commands directly into the data stream. This is typically used for either troubleshooting or custom override commands.



### 3.16.10 Printing Preferences - Paper tab

The Paper tab is where the user adds custom form sizes and adjusts minor handling effects. The form sizes that are created here are added to the Windows Print Server Properties for the model installed.



#### 3.16.10.1 Paper tab - Rotation

The rotation setting rotates the image being printed. This is used when Portrait or Landscape is used. The “A” image shows the rotation setting impact.

#### 3.16.10.2 Paper tab - Units

This is used to select the units that the driver uses for most measurements. Some units are in dots or pixels and should be entered as such.

#### 3.16.10.3 Paper tab - Page Sizes

This is where the user enters forms to the Print Server Properties of the driver. Select the drop down menu to select standard forms that have been installed with the driver or enter the size of your form and select the New icon to create a form size that matches your media.

#### 3.16.10.4 Paper tab - Mirror

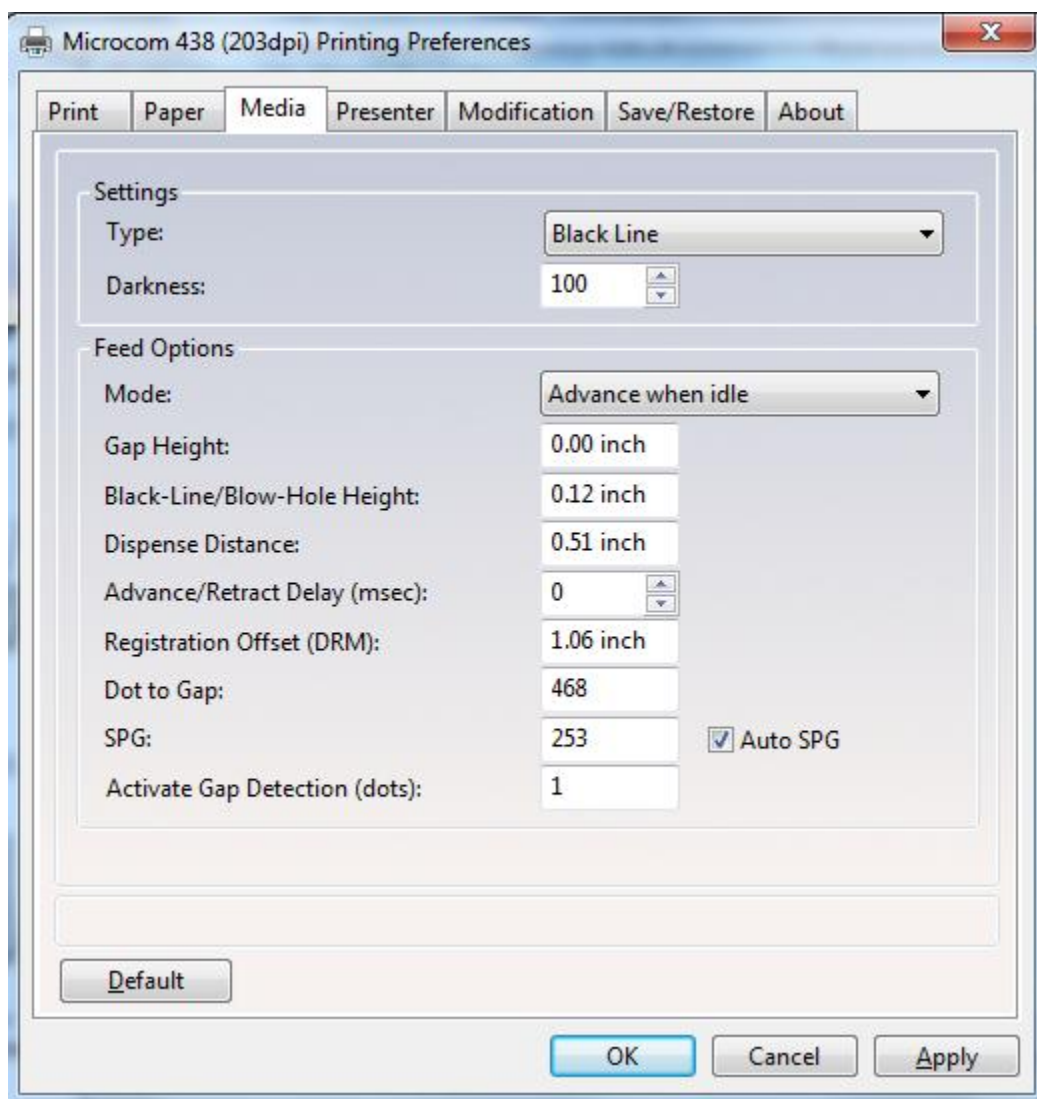
Selecting this option will cause the image to appear like it being observed in a mirror.

### 3.16.10.5 Paper tab - Default

This button will cause the driver to load in its default settings for the model driver installed. Please note that this default may not represent your media type or size.

### 3.16.11 Printing Preferences - Media tab

The Media tab is used to set specific setting of the media size and operations that in a form that the printer requires to maintain correct registration.



#### 3.16.11.1 Media tab - Settings

The Settings control the Type of registration that the printer will use to align the media being used and the Darkness of the image being printed.

##### 3.16.11.1.1 Settings - Type

This field sets the registration method that the printer will use to register job to job. This type should be set to the type of registration mark that is used to indicate the form size. The Continuous setting instructs the printer to ignore registration marks and will move media based on the form size settings. The Blackline setting cause the printer's reflective sensor to look for a blackline mark and register based on the other Feed options. The Diecut and

Blowhole settings cause the printer to use its transmissive sensor to detect the backing material between labels or an actual hole in the media.

#### **3.16.11.1.2 Settings - Darkness**

This sets the darkness or contrast that the printer uses to image. As the value increases, the higher the thermal temperature setting is used for imaging. The lowest temperature that produces quality images should be used to extend the printhead life.

#### **3.16.11.2 Media tab - Feed Options**

The Feed options handle post printing dispensing and media options that are used by the printer to properly register the media from page to page.

##### **3.16.11.2.1 Feed Options - Mode**

The Mode is used to select the type of dispense option used after the printer has printed. The options include None, Advance when idle, Advance every label, Cut after label, and Cut with LPD.

Selecting the “None” option will disable the dispense modes. The printer will print the job and then stop without performing any dispense option.

The Advance when idle dispense option causes the printer to advance the Dispense Distance after the printer’s communication port has gone idle. This mode does not require a label present sensor to function. For example: If printing 5 jobs, the printer would advance after printing the fifth job.

The Advance every label is a dispense mode that does use the printer’s label present sensor. The printer will print a job and then advance the job by the Dispense Distance. A second job will not be processed until the printed/dispensed job has been taken (the LPD no longer detects the advanced job). Once the job has been taken, the printer will process the next print job. The Advance/Retract delay is also used in conjunction with this command. This delay starts after the label has been taken.

Cut after label causes the printer to advance the Dispense Distance after the job has been printed and then cycles the cutter. This mode does not use the Label Present Sensor.

The Cut with LPD is a mode that the printer will advance the Dispense Distance after printing and cut the label. The LPD is used to prevent the next job from printing until the current job has been taken by the user.

##### **3.16.11.2.2 Feed Options - Gap Height**

This field is used to specify the height of the backing material between labels typically found on die cut media types. As the media is moved through the printer, the height of the Gap would be what the printer’s transmissive sensor would detect and use for page to page registration.

##### **3.16.11.2.3 Feed Options - Blackline/Blowhole Height**

This field is used to specify the height of the blackline or Blow hole that is used for registration on media types containing a blackline or blowhole. The printer uses its reflective sensor to detect the blackline as the media is passed through the printer and would use its transmissive sensor to detect the blowhole.

#### **3.16.11.2.4 Feed Options - Dispense Distance**

This is the distance that the printer uses to move the media forward to dispense and it used in conjunction with the Mode. The printer moves out this distance and then would retract the same distance so it does not impact registration.

#### **3.16.11.2.5 Feed Options - Advance/Retract Delay**

This field is used to specify how long the printer will wait in msec after the media has been taken when the Advance every label mode or Cut with LPD modes are used.

#### **3.16.11.2.6 Feed Options - Registration Offset (DRM)**

The registration offset is used by the printer to calculate the correct SPG (Steps Past Gap) value that the printer will use for registration. This distance is from the first printable area of the media to beginning of the registration mark as it would pass through the printer.

#### **3.16.11.2.7 Feed Options - Dot2Gap**

This field is the distance of the registration sensors to the dot row and is used to calculate the Steps past gap or SPG value used to align the print from page to page. This value is fixed value for each printer model. Some printer models have a different sensor location for the blackline reflective sensor and the Transmissive Gap sensor. Please review the printer manual for more information regarding the correct value for the Dot2Gap. The value entered is in dots or pixels.

#### **3.16.11.2.8 Feed Options - SPG**

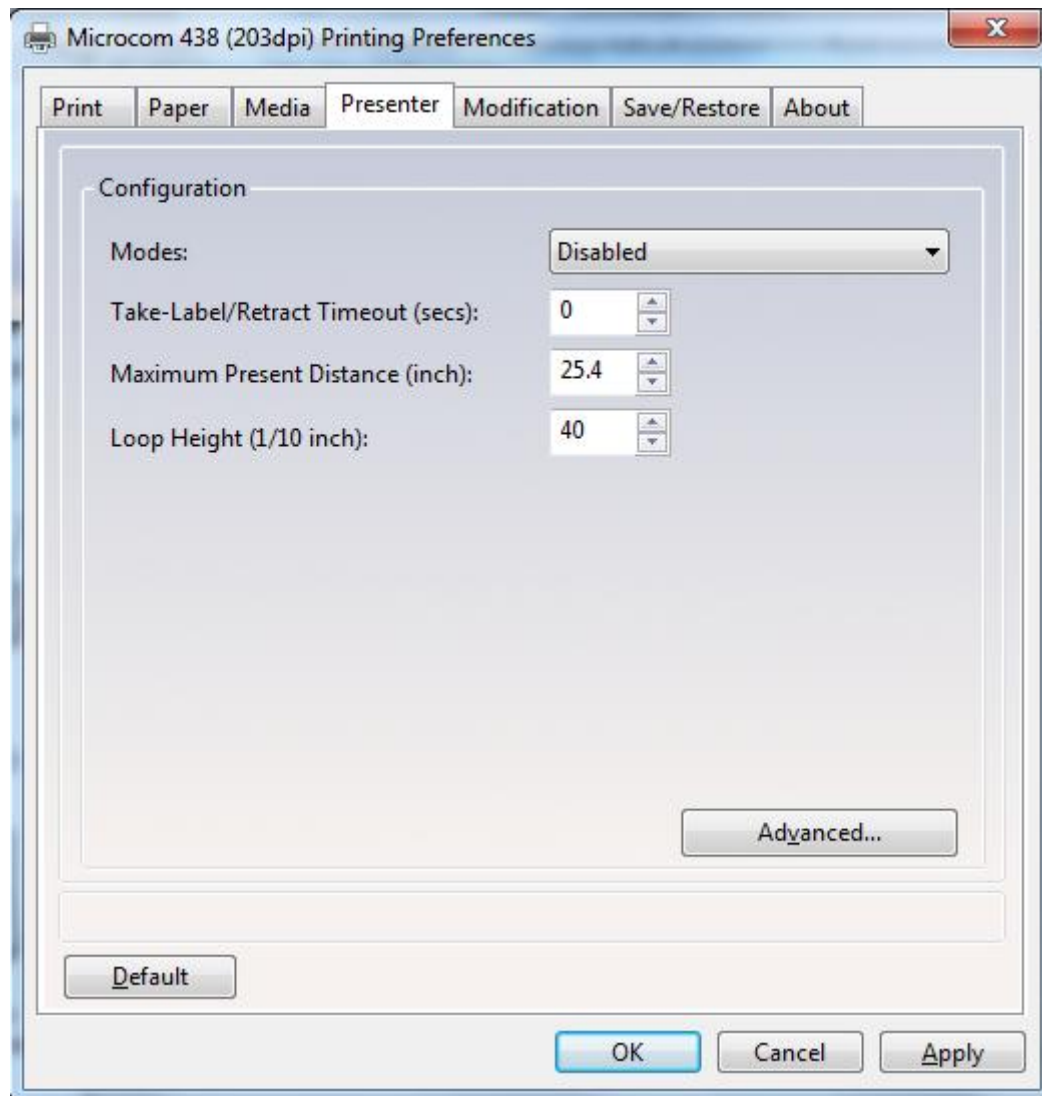
The Steps Past Gap (SPG) is a format header parameter that the printer uses to register the page properly. If the Auto SPG is checked, the driver will automatically calculate the proper SPG based on the other entered fields. If unchecked, the SPG is entered in manually. This value is entered in as dots.

#### **3.16.11.2.9 Feed Options - Activate Gap Detection (dots)**

The Activate Gap Detection is the distance in dots that the printer will move media before trying to detect a registration mark. The default of 1 typically works for most media types. If the media being used contains preprint in the sensor area, the AGD may need to be used to disable registration detection until passing over the preprinted areas.

### **3.16.12 Printing Preferences - Presenter tab**

The Presenter tab controls the operation of the optional presenter available on some printer models. A presenter is a post printing device that typically takes a printed and cut form and presents it to the user only after it has printed completely. Not every printer model is capable of running a presenter. Check with your printer model operator's manual to see if a presenter is supported. This tab is ignored on models that do not support the use of a presenter.



### 3.16.12.1 Presenter tab - Configuration

The fields listed under the Configuration section control the Presenter operation on printer model that are compatible with the presenter.

### 3.16.12.2 Configuration - Modes

This is used to select the mode of the presenter. The valid modes are enabled, passthrough, and disabled. When selecting Enabled, the printer with presenter would present the media using the other fields for operation while selecting Passthrough mode will simply cause the presenter to run while the printer is printing.

#### 3.16.12.2.1 Configuration - Take-Label/Retract Timeout (secs)

This field controls the time that the presenter will present the paper before retracting into the waste bin.

#### 3.16.12.2.2 Configuration - Maximum Present Distance (inch)

This is the maximum size that the printer will present when using the enabled mode. This value is in inches.

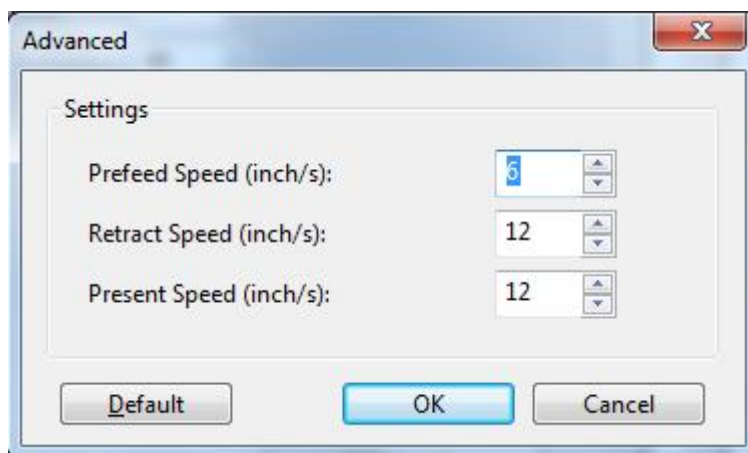


### 3.16.12.2.3 Configuration - Loop Height (1/10 inch)

The Loop Height is a value in 1/10 inch that the printer uses to delay the presentation of the media. The printer would print and form a loop at the presenter and once this value is reached, the presenter would present.

### 3.16.12.3 Configuration - Advanced

The Advanced button is included as a manual override of the recommended settings that the presenter will use for the various speeds. Typically, these values do not need to be adjusted for the presenter to function.



### 3.16.13 Printing Preferences - Modification tab

This tab is used to control the number of copies, print speed, and port monitor status enable.

#### 3.16.13.1 Modification - No of Labels

This field controls how many copies of the current page will be printed.

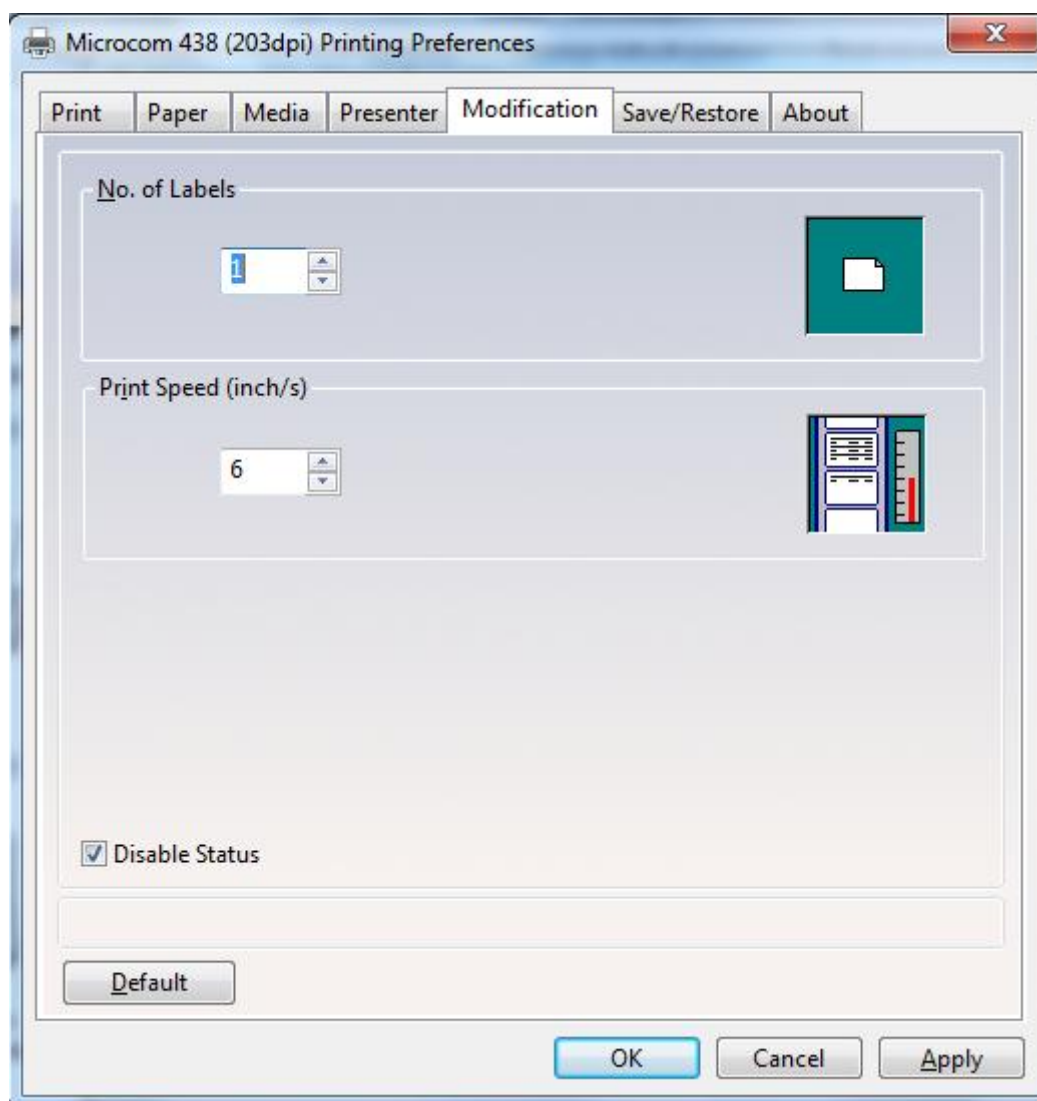
#### 3.16.13.2 Modification - Print Speed (inch/s)

The Print Speed field controls the print speed that the printer uses to print a page.

#### 3.16.13.3 Modification - Disable Status

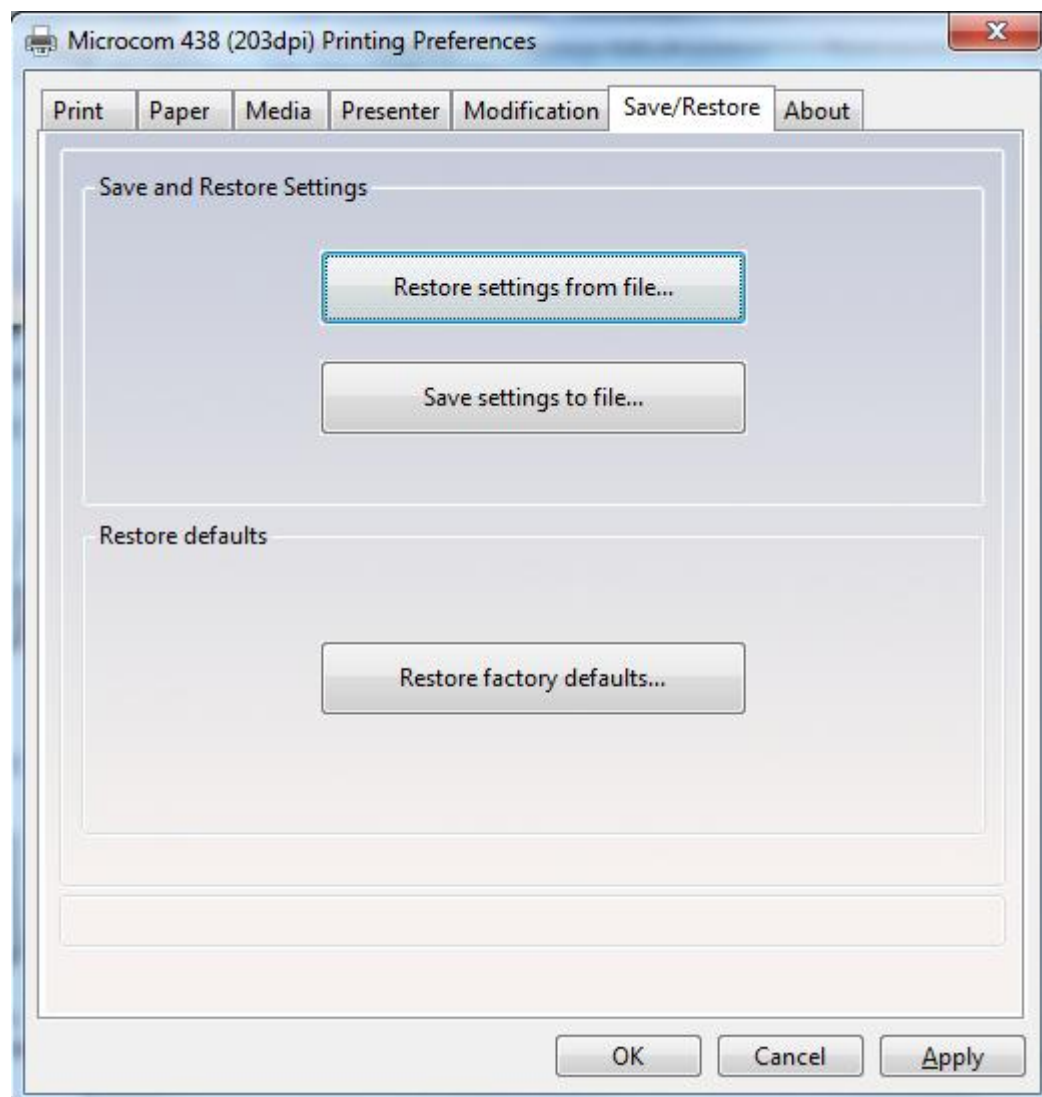
The Disable Status checkbox is used to control whether the Port Monitor Status popup window is displayed or not. This is used to get real time status from the printer while printing via the Windows driver.





### 3.16.14 Printing Preferences - Save/Restore tab

The Save/Restore tab is used to export or import driver settings and to force back to the factory defaults based on the printer model installed.



#### 3.16.14.1 Save/Restore - Restore settings from file...

This is used to import or restore driver settings from a .MDS file. The driver settings are contained within a .MDS file and may be restored or configured if imported using the Restore feature.

#### 3.16.14.2 Save/Restore - Save settings to file...

This is used to export or save the current settings in a .MDS file. This file contains the driver setup used to configure the driver.

#### 3.16.14.3 Save/Restore - Restore factory defaults...

This will force the driver defaults of the printer model installed.

### 3.16.15 Status Messages

This section describes the Windows compatible Status messages that are displayed in spooler and the Status Monitor feature found on the Modification tab. These messages may

be extracted using the GetPrinterData MSDN API call. The standard message and the printer meaning are listed below.

#### **3.16.15.1 PRINTER\_STATUS\_WAITING**

This message indicates that the printer is okay and ready to print. LDS1 control language printer message would be the >READY<.

#### **3.16.15.2 PRINTER\_STATUS\_BUSY**

Message indicates that the printer is busy printing a job. No LDS1 equivalent control language printer message.

#### **3.16.15.3 PRINTER\_STATUS\_PAPER\_OUT**

This message indicates that the printer does not detect media in the printer or has run out of media. The LDS1 equivalent control language printer message would be >STOCK NOT LOADED< or >LOW STOCK<.

#### **3.16.15.4 PRINTER\_STATUS\_PAPER\_JAM**

Message is used to indicate that the printer has detected a media jam. The LDS1 control language printer message would be the >LPD STOCK JAM<.

#### **3.16.15.5 PRINTER\_STATUS\_PAPER\_PROBLEM**

This message is used to indicate that the optional >INPUT 1< sensor is active. The >INPUT 1< message is the equivalent LDS1 control language printer message that is reported.

#### **3.16.15.6 PRINTER\_STATUS\_USER\_INTERVENTION**

This message indicates that the printer is in an error condition that needs to be corrected before the printer may continue. The LDS1 messages that generate this error would be >CUTTER ERROR<, >DATA ERROR<, >FAIL TIMEOUT<, or >FAIL SIZE< LDS1 control messages.

#### **3.16.15.7 PRINTER\_STATUS\_OFFLINE**

Message indicates that the printer is powered down or the driver is unable to communicate with the printer. No LDS1 equivalent control language printer message.

#### **3.16.15.8 PRINTER\_STATUS\_OUTPUT\_BIN\_FULL**

This message is used to report that the printer is reporting that its catch tray is full or that the printer's media is advanced blocking the LPD sensor while in a dispense mode. The LDS1 control language messages that generate this message would be the >TRAY FULL< and >TAKE LABEL< messages.

#### **3.16.15.9 PRINTER\_STATUS\_DOOR\_OPEN**

This message is generated when the printer detects that its printhead assembly is not fully closed. Not all printers support this feature. The LDS1 control language message equivalent would be the >HEAD UP< message.

#### **3.16.15.10 PRINTER\_STATUS\_IO\_ACTIVE**

This message is used to indicate that the optional >INPUT 2< sensor is active. The >INPUT 2< message is the equivalent LDS1 control language printer message that is reported.

## 3.17 Configuration Application

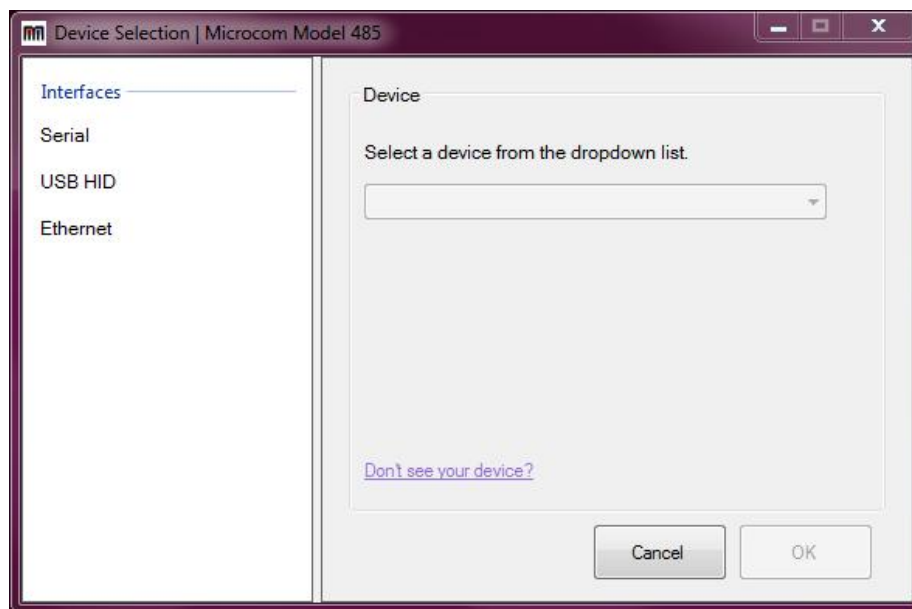
The 485 Configuration Application and its dependencies are installed by running the provided setup utility. Most modern versions of Windows require Administrator privileges to perform this type of installation.

For 32-bit Windows systems, run *Microcom485ConfigurationAppSetup\_x86.exe*. For 64-bit Windows systems, run *Microcom485ConfigurationAppSetup\_x64.exe*.

The setup utility will guide you through the installation process. Take note of the installation directory. By default, application package files will be placed in either the “C: Program Files” or “Program Files (x86)” directory.

### 3.17.1 Selecting a Device

The 485 Configuration Application allows a printer to be configured via an RS-232 serial, USB serial, USB HID, or Ethernet connection to a computer. With the exception of RS-232, all of these interfaces can be enabled/disabled on the printer. To determine which interfaces are enabled, a diagnostic label may be printed by powering down the printer and powering it back on while holding the front panel button OR simply by pressing the front panel button while in FGL mode. Once you know which interface to use, simply select it on the left panel, choose it from the selection list on the right, and click OK.



#### 3.17.1.1 Configuration Application - Serial (USB / RS-232)

RS-232 and USB CDC (USB serial) connections will be recognized as COM devices by Windows. Typically, more than one COM device will be found by the application. To determine which COM port is bound to the Model 485, check the ‘Devices and Printers’ menu in the Windows Control Panel. The printer should be listed as *Microcom 485 Thermal Printer (COM#)* - choose this same COM device within the 485 Configuration Application to configure the printer using RS-232 or USB serial as the active interface.

### 3.17.1.2 Configuration Application - USB HID

A USB Human Interface Device (USB HID) is a generic classification of an input device. Windows comes pre-loaded with the USB HID drivers necessary to communicate with the Model 485, which means there is nothing for the user to install.

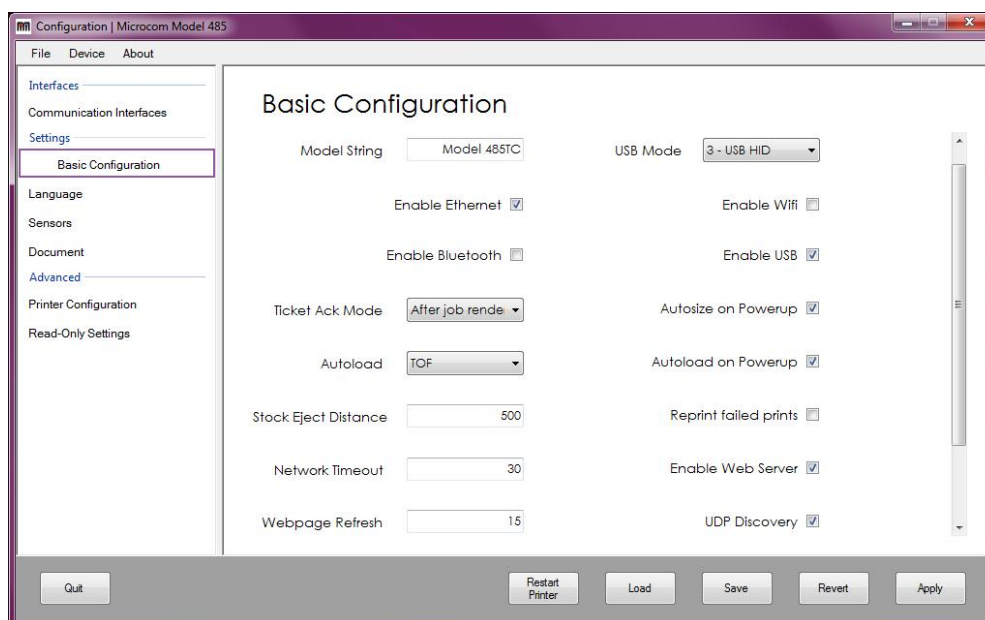
As is the case with COM devices, the 485 Configuration Application will typically find more than one USB HID device. Microcom printers are identified as such and will be listed as “Microcom - <Model> - <Serial Number>”. For example, the device selection box would list a Microcom 485 as “Microcom - 485 - 123456”. Choose the desired printer from the selection list. If more than one Microcom 485 is connected to your computer and you do not know the serial number, press the push button on the printer to print a test ticket while in FGL mode or a double press while in Graphics mode.

### 3.17.1.3 Configuration Application - Ethernet

If your Microcom 485 and computer share an ethernet network connection, the 485 Configuration Application can use the printer IP address and port to communicate. In the text field, enter the printer’s IPv4 address in its usual format of “aaa.bbb.ccc.ddd”, then enter the port that the printer is configured to listen on. If you do not know the port or the IP address, press the push button on the printer to print a test ticket with this information (FGL mode only). The default IP address and port are 192.168.200.3 and 9100, respectively.

## 3.17.2 Configuring a device

Once you have chosen the appropriate interface and successfully connected to the 485 printer, the configuration window will appear. The window is essentially made up of three panels: the configuration categories (left), configuration values (right), and printer control button panel (bottom). Configuring your 485 is as simple as changing the value, clicking Apply, and then clicking Restart.



### 3.17.2.1 Applying changes

To apply all configuration changes to the printer, click the Apply button. When this button is clicked, the values held by the on-screen controls are sent to the printer. The printer must be restarted for the changes to take effect. A restart can be performed by clicking the Restart button or by manually turning off and on the power switch on the printer. When the printer reboots, the changes will be in place.

### 3.17.2.2 Reverting changes

When the Revert button is clicked, the values held by the on-screen controls will change back to what they were when the device was first connected to when the application started. In other words, the revert point is the point at which the Configuration window is first loaded. If you have applied changes but have not restarted the printer for them to take effect, clicking Revert will undo all the changes even if the Apply button has been clicked.

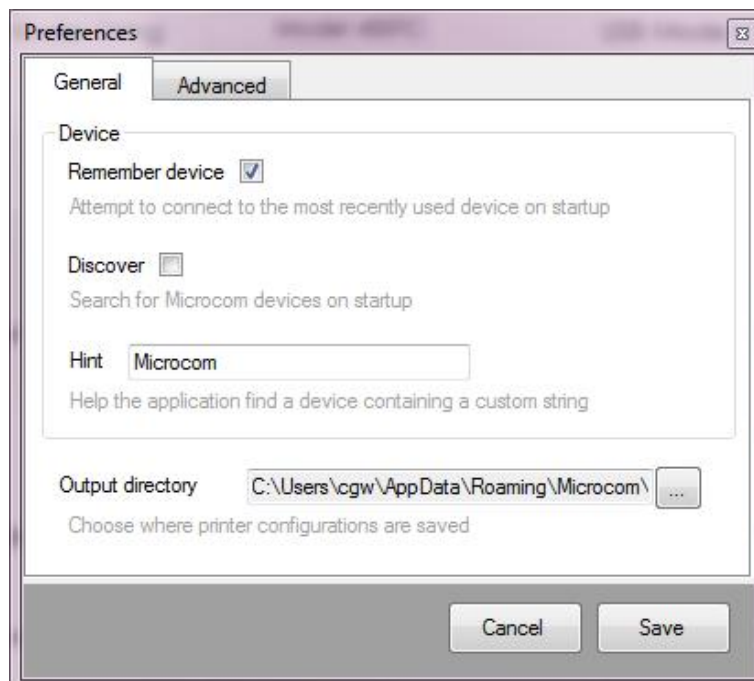
### 3.17.2.3 Saving/loading configuration files

A configuration file is generated by the application when the Save button is clicked, or when the File->Save configuration menu option is selected. Clicking either of these two options will open a Windows Save As dialog in the application output directory. A unique filename is generated by default to avoid overwritten configurations.

To load a configuration file, click the Load button or the File->Load configuration menu option. The application will open a file dialog in the application output directory. Select a configuration file, and click "Open" to update the on-screen controls with the configuration values contained in the file. Note that loading a file does not send the configuration to the printer until the Apply button is clicked.

## 3.17.3 Application preferences

The Preferences window can be accessed by selecting File->Preferences from the menu bar. Within the preferences you can change the application output directory, gain access to read-only settings (with a password of course), and more.



## Chapter 4 Printer Maintenance

### 4.1 Maintenance Schedule

It is important to note that the optimum print quality and print head life is achieved by maintaining a clean printer and print head. A Microcom Corporation approved cleaning kit (part # 040005-0000) is available; contact your sales representative for purchasing information.

AREA	METHOD	INTERVAL
Print Head	Foam tipped swab, cotton tipped swab, or thermal printer cleaning card dampened with Isopropyl Alcohol.	After every roll of media or every 512 feet of tag stock or fanfold media.
Drive Roller	Foam tipped swab, cotton tipped swab, thermal printer cleaning card, or lint-free cloth dampened with Isopropyl Alcohol	After every roll of media or every 512 feet of tag stock or fanfold media.
Peel Edge	Foam tipped swab, cotton tipped swab, thermal printer cleaning card, or lint-free cloth dampened with Isopropyl Alcohol	As Needed.
Interior Cleaning	Compressed air, static protected vacuum cleaner, soft-bristle brush, and/or lint-free cloth dampened with Isopropyl Alcohol.	As Needed.
Exterior Cleaning	Lint-free cloth dampened with a mild, non-abrasive general purpose cleaner.	As Needed.

**Table 4-1 Recommended Maintenance Schedule**



**CAUTION:** Microcom Corporation will not be held responsible for damage caused by any non-approved solvent, cleaning material and/or method. The use of such non-approved materials and/or methods may void appropriate expressed or implied warranties.

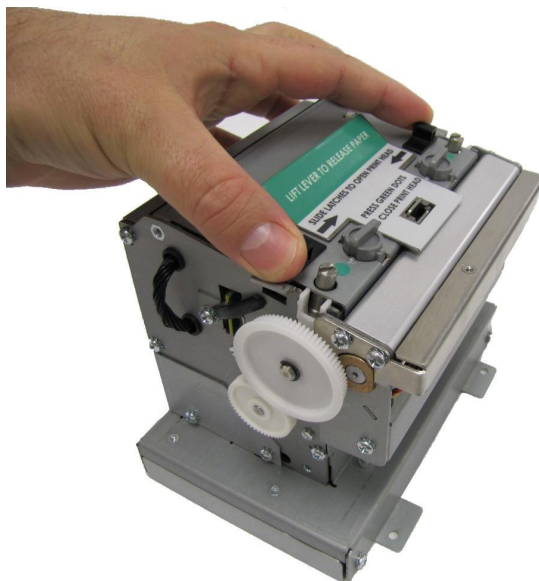
### 4.2 Thermal Printer Cleaning Card

Any decline in print quality, voids or dropout areas in bar codes and/or graphics may indicate that the print head is dirty and needs to be cleaned. The necessary cleaning materials can be purchased through Microcom Corporation by contacting your sales representative and ordering the *Cleaning Kit, part # 040005-0000*. The print head should be cleaned after every roll of media or after every 512 feet of fanfold media (a typical stack of tag or fanfold media is approximately 3,200 tags) to achieve the maximum printhead life.

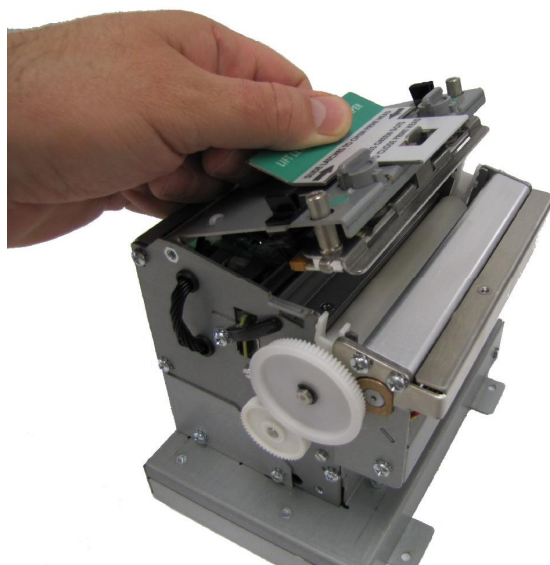


A thermal printer card is the quickest and easiest way to clean the print head, drive roller, and peel edge all at the same time. Follow the steps below for the proper cleaning procedure.

1. Remove any installed media.
2. Dampen both sides, on one end, of the cleaning card with isopropyl alcohol or use a pre-moistened cleaning card.
3. Release the printhead assembly to insert the cleaning card under the printhead.



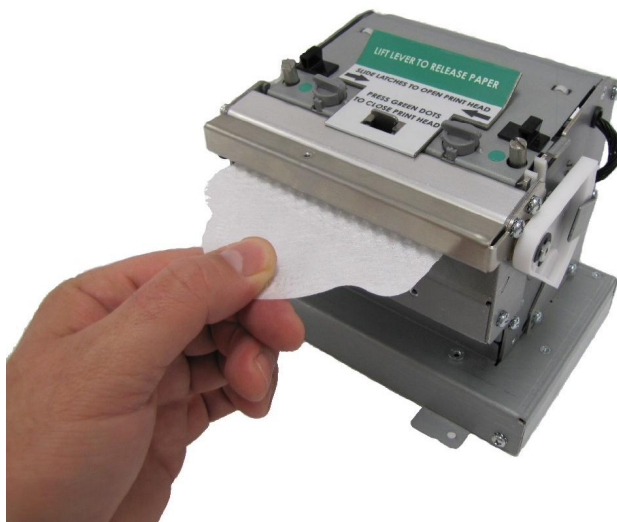
**Figure 4-1 Releasing the Printhead Assembly**



**Figure 4-2 Rotate the Printhead Assembly to the Open Position**



4. Re-latch the printhead assembly, hold the printer, and slowly pull the cleaning card (you will feel resistance) out of the printer.



**Figure 4-3 Remove the Cleaning Card**

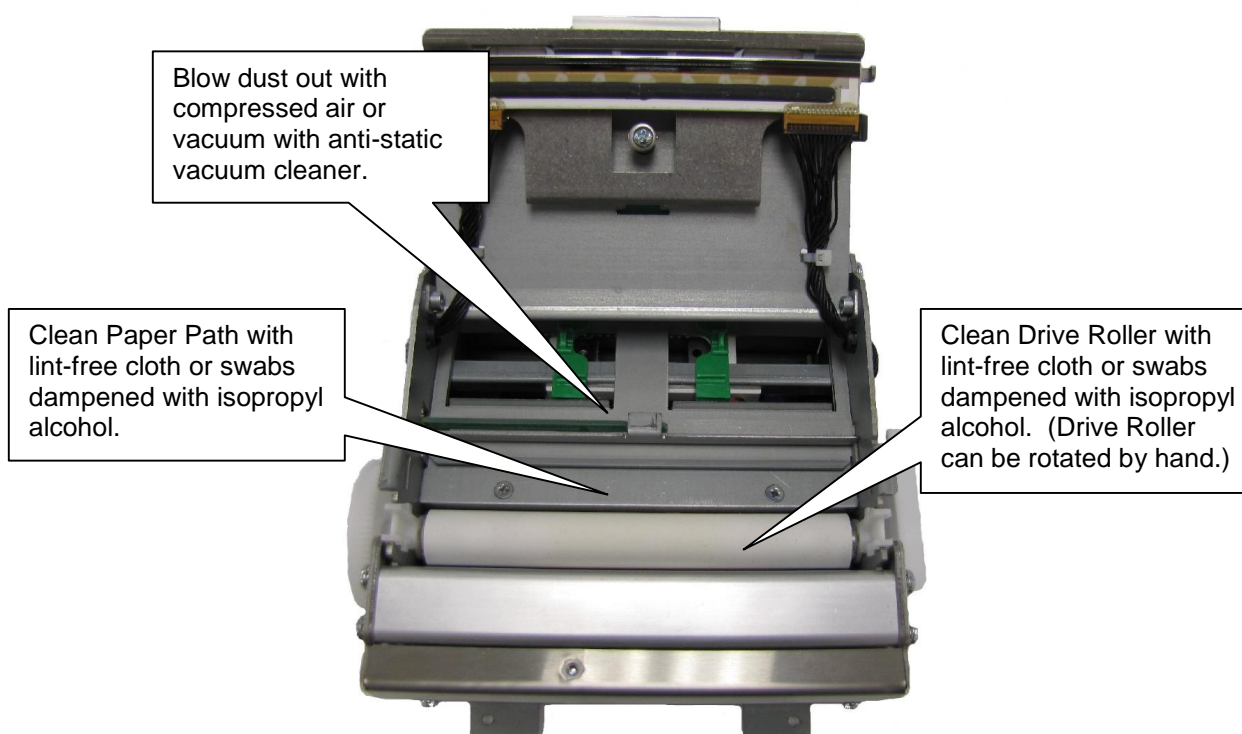
5. Reinstall the media and check print quality.
6. Repeat cleaning steps if necessary.

*Thermal cleaning cards should not be used more than three times each. Extremely dirty cards should be disposed of immediately.*

### 4.3 Internal Cleaning

The overall internal cleaning of the printer is important to help reduce the dust and other contaminants residing in the printer that may attach to the print head or drive roller and affect the printer's performance.

1. Remove any installed media.
2. Turn the printer power "OFF."
3. Release the printhead assembly and rotate to the open position.
4. The exposed Drive Roller, Printhead, and Paper Path may be cleaned using a cotton swab or lint-free wiping rag dampened with isopropyl alcohol.



**Figure 4-4 Internal Cleaning**

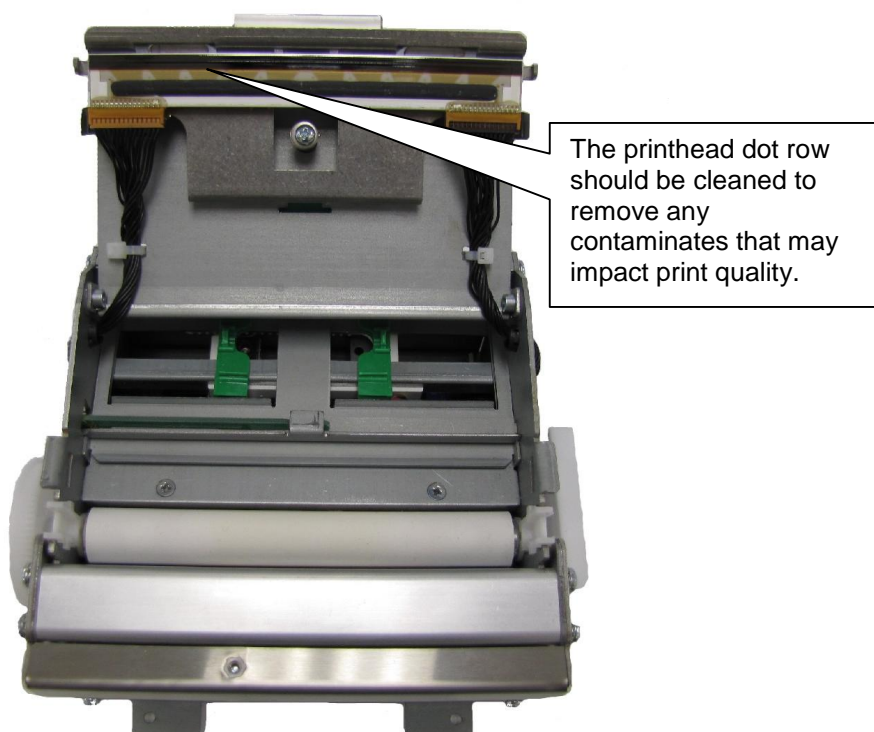
## 4.4 Print Head Maintenance

If print quality has not improved after using a thermal cleaning card, or if one is not available, foam or cotton tipped swabs or a clean lint-free cloth dampened with isopropyl alcohol may be used. Follow the steps below to clean the print head.

1. Release the Print Head Assembly and rotate to the open position.
2. With a foam or cotton tipped swab or soft, lint-free cloth dampened with isopropyl alcohol, clean the thermal elements by gently rubbing the swab down the length of the print head dot row. Allow for the alcohol to evaporate, then repeat if necessary.
3. Reinstall media and run labels to check print quality.
4. If poor print quality persists, print head or other parts may be damaged.



**CAUTION:** Isopropyl Alcohol or other approved non-Abrasive solution should be used to clean the drive roller. The use of other cleaning solvents or materials is not recommended and may degrade the performance of the drive roller.

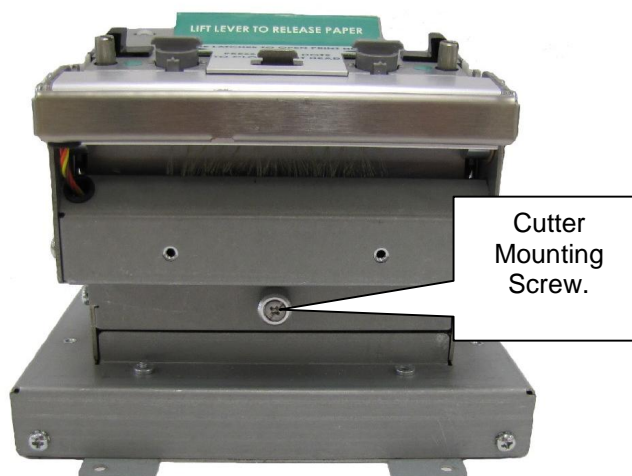


**Figure 4-5** Cleaning the Print Head

## 4.5 Replacing the Drive Roller

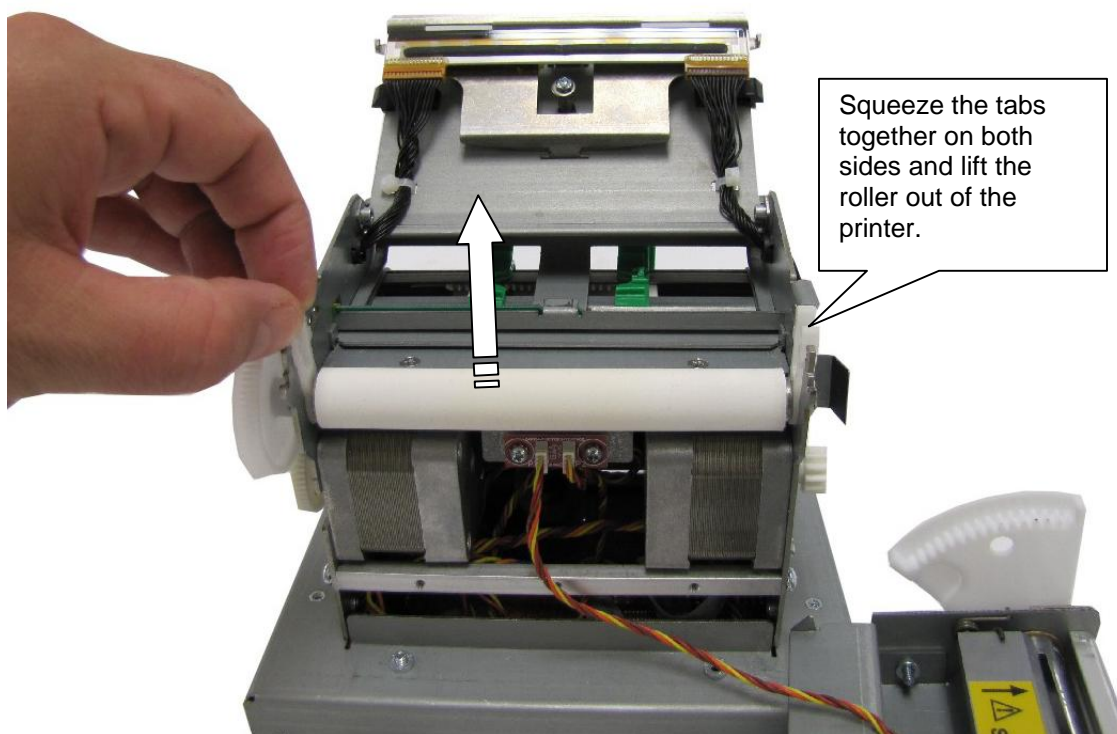
Over time, the platen may harden and cause print issues and need to be replaced. The printer is equipped with an easy replaceable drive roller assembly.

1. Release the Print Head Assembly and rotate to the open position.
2. Unscrew the Cutter or Tear Assembly using the mounting screw that is located in the bottom center on the front of the Print Mechanism.



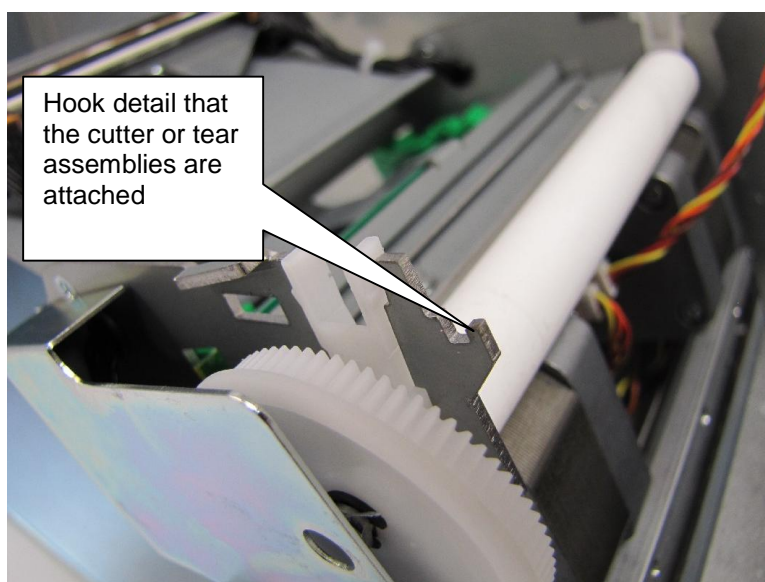
**Figure 4-6** Cutter or Tear Assembly Mounting Screw

3. Squeeze the white plastic bushing together on both sides of the platen to release from the sheet metal and lift the platen assembly up and out of the printer.



**Figure 4-7 Removing the Platen**

4. Replace the assembly with a new platen assembly making sure that the bushings snap into the sheet metal.
5. Reattach the cutter or tear assembly taking care to locate the top lip of the assembly to the hook detail in the sheet metal.



**Figure 4-8 Cutter or Tear Assembly Mounting Hook**



6. Close the printhead assembly to the home position and latch into place.

## 4.6 Adjusting Printhead Pressure

The printer has two head pressure settings to support both narrow and wide media types. The printhead pressure is typically changed to a lighter pressure when the media being used is 2" wide or less. Extra drag on the platen may cause feeding issues if a heavy spring pressure is used with the narrow stock types.

The heavy spring pressure is typically used on media that is over 2" wide. The spring pressure is not intended to overcome print quality issues. If light print is detected, please adjust your printer's contrast setting (^D36) and/or verify that the thermal coating on the media is sufficient.



Figure 4-9 Narrow Media Light Spring Setting



Figure 4-10 Wide Media Heavy Spring Setting



# Chapter 5: Troubleshooting

## 5.1 Troubleshooting Tips

### ***The printer fails to turn “ON” and the status indicator light fails to light:***

- ✓ Verify that the power cord is connected to the printer, as well as the AC outlet.
- ✓ Verify that the printer power switch is in the “ON” position.
- ✓ Verify that the AC outlet is functioning properly.
- ✓ Contact your Service Representative.

### ***The printer has no communication:***

- ✓ Verify that the communication cable is properly connected to the printer and an available communication port on the host computer.
- ✓ Verify that the host communication port is functioning properly.
- ✓ Verify that the printer and the host communication parameters are set correctly.
- ✓ Verify that nothing else is configured on the same port.
- ✓ Is the printer in an Error?
- ✓ Contact your Service Representative.

### ***Vertical blank or light lines appear on printed areas:***

- ✓ Clean the print head.
- ✓ Print head may need to be replaced.
- ✓ Contact your Service Representative.

### ***The print does not align to my media:***

- ✓ Verify that the media contains some sort of registration mark.
- ✓ Verify that the printer is received proper formatting instructions.
- ✓ Verify that nothing is blocking the internal registration mark sensors.
- ✓ Contact your Service Representative.

***The status indicator light is solid amber in color:***

- ✓ Indicates that the printer is the Bootloader, make sure that an application has been installed.
- ✓ Contact your Service Representative.

***The status indicator light is solid red in color:***

- ✓ The printer has an error and requires service before printing will continue.
- ✓ Verify that media has been loaded in the printer properly.
- ✓ Press the print button to attempt to clear the error.
- ✓ Cycle power to reset the printer.

***The status indicator light is flashing red in color:***

- ✓ Generally due to a power fail error.
- ✓ Verify that the AC line-voltage is present at the AC outlet.
- ✓ Cycle power.



# Index

## General Index

Agency Approvals.....	1-1
Alphanumeric .....	7-5
Bar codes .....	1
Barcode.....	7-5
Black-line.....	7-5
Blow-hole .....	7-5
Cleaning Kit .....	2-2, 4-1
Communication	
RS-232C Serial .....	3-2
Continuous media .....	7-5
CTS .....	7-5
Cutter .....	7-5
Data Bits.....	1-1
DCD .....	7-5
DCE .....	7-5
Die-cut media .....	7-5
Direct Thermal.....	7-5
DPI.....	7-5
Drive Roller.....	4-1, 7-5
DSR .....	7-5
DTE .....	7-5
DTR.....	7-6
Electrical .....	1-1
Ethernet .....	7-6
Fanfold media.....	7-6
Flash Memory.....	1-1
FLASH memory .....	7-6
Flow Control .....	1-1, 3-2
Fonts.....	2-1
GND.....	7-6
Graphics.....	2-1
Guillotine cutter.....	7-6
Humidity .....	1-1
Indicator Light.....	3-8, 3-9, 5-1, 5-2
Inspection .....	3-1
Isopropyl Alcohol .....	4-2, 4-4
LDSII .....	7-6
Limited Warranty .....	7-1
Maintenance .....	4-1, 4-4
Exterior .....	4-1
Interior .....	4-3
Printhead .....	4-4
Schedule .....	4-1
Thermal Card.....	4-1
Media .....	1-2
Maximum Thickness .....	1-2
Maximum Width.....	1-2
Specifications .....	1-2
Types.....	1-2, 7-5, 7-6, 7-7
Media Width .....	1-2
Memory .....	1-1, 7-6, 7-7

Flash .....	1-1
SDRAM.....	7-7
SRAM.....	1-1, 7-7
Modes.....	3-9
Diagnostic .....	3-10
Operation	
Indicator Light .....	3-9
Options .....	2-1
Packaging .....	3-1
Parity .....	1-1
Peel Edge.....	4-1
Platen.....	7-6
Print Button .....	3-8, 3-9
Print Length .....	1-1
Print Resolution .....	1-1
Print Speed .....	1-1
Print Type .....	1-1
Print Width .....	1-1
Printer Depth .....	1-1
Printer Height .....	1-1
Printer Weight .....	1-1
Printer Width .....	1-1
Printhead.....	7-5, 7-7
Return Material Authorization.....	7-3
Rolled media.....	7-6
Rotary Cutter .....	7-6
RS-232.....	7-6
RS-232 signals	
CTS .....	7-5
DCD .....	7-5
DCE.....	7-5
DSR.....	7-5
DTE.....	7-5
DTR.....	7-6
GND .....	7-6
RTS .....	7-6
RXD.....	7-7
TXD.....	7-7
RS-232C Cable.....	3-2
RTS.....	7-6
RXD .....	7-7
SDRAM .....	7-7
Shipping Damage .....	3-1
Specifications.....	1-1
General .....	1-1
Media .....	1-2
Printing .....	1-1
SRAM .....	1-1, 7-7
Tag stock .....	7-7
Temperature.....	1-1
Thermal Printer Card .....	4-2
Troubleshooting.....	5-1
TXD .....	7-7
Unpacking .....	3-1
USB .....	7-7
Warranty .....	7-1

## List of Figures

Figure 3-1	Typical Printer Accessories .....	3-1
Figure 3-2	Printer Rear Panel.....	3-2
Figure 3-3	RJ12 Serial Option Wiring .....	3-3
Figure 3-4	Cash Drawer Pin-out.....	3-5
Figure 3-5	Cash Drawer RJ12 Adapter .....	3-6
Figure 3-6	Loading Media.....	3-7
Figure 3-7	Print Button and Status Indicator Light.....	3-8
Figure 3-8	Statistics Label Example .....	3-10
Figure 3-9	Test Ticket Example.....	3-11
Figure 3-10	TOF (Top-Of-Form) Sensor.....	3-12
Figure 3-11	Rolled Media Holder.....	3-12
Figure 3-13	Wristband Media Adapter.....	3-13
Figure 4-1	Releasing the Printhead Assembly .....	4-2
Figure 4-2	Rotate the Printhead Assembly to the Open Position .....	4-2
Figure 4-3	Remove the Cleaning Card .....	4-3
Figure 4-4	Internal Cleaning .....	4-4
Figure 4-5	Cleaning the Print Head .....	4-5
Figure 4-6	Releasing the Print Mechanism.....	4-5
Figure 4-7	Cutter or Tear Assembly Mounting Screw .....	4-6
Figure 4-8	Removing the Platen .....	4-6
Figure 4-9	Cutter or Tear Assembly Mounting Hook .....	4-7
Figure 4-10	Narrow Media Light Spring Setting.....	4-8
Figure 4-11	Wide Media Heavy Spring Setting.....	4-8



## List of Tables

Table 1-1	General Specifications .....	1-1
Table 1-2	Printing Specifications .....	1-1
Table 1-3	Media Specifications .....	1-2
Table 3-1	RS-232 Cable Configurations.....	3-3
Table 3-2	RJ12 Adapter Pin-out.....	3-6
Table 3-3	Print Button Description.....	3-8
Table 3-4	Status Indicator Light Description.....	3-9
Table 4-1	Recommended Maintenance Schedule.....	4-1



# Appendix

## Appendix A: Limited Warranty

Microcom Corporation printers, excluding thermal print heads, which are warranted separately below, are warranted against defects in material and workmanship for twelve (12) months from the date of original shipment by Microcom Corporation. This warranty does not cover normal wear and tear and shall be null and void if the printer is modified, improperly installed or used, damaged by accident or neglect, or in the event any parts are improperly installed or replaced by the user.

The thermal print head is covered by a limited warranty of three (3) months or 500,000 linear inches to be free from defects in material and workmanship. The length of media run through the printer may be verified using the printer's internal statistical counter. Although the user is not required to purchase Microcom Corporation brand supplies, to the extent it is determined that the use of other supplies (such as non-approved label stock, ribbons, and cleaning solutions) shall have caused any defects in the thermal print head for which the warranty claim has been made, the user shall be responsible for Microcom Corporation's customary charges for labor and materials to repair such defects.

MICROCOM CORPORATION'S SOLE OBLIGATION UNDER THIS WARRANTY SHALL BE TO FURNISH PARTS AND LABOR FOR THE REPAIR OR REPLACEMENT OF PRODUCTS FOUND TO BE DEFECTIVE IN MATERIAL OR WORKMANSHIP DURING THE WARRANTY PERIOD.

Except for the express warranties stated, Microcom Corporation disclaims all warranties on products, including all implied warranties of merchantability and fitness for a particular purpose. The stated warranties and remedies are in lieu of all other warranties, obligations or liabilities on the part of Microcom Corporation for any damages, including, but not limited to, special, indirect, or consequential damages arising out of or in conjunction with the sale, use, or performance of these products.

MICROCOM CORPORATION SHALL NOT, UNDER ANY CIRCUMSTANCES WHATSOEVER, BE LIABLE TO THE BUYER OR ANY OTHER PARTY FOR LOST PROFITS, DIMINUTION OF GOODWILL OR ANY OTHER SPECIAL OR CONSEQUENTIAL DAMAGES WHATSOEVER WITH RESPECT TO ANY CLAIM HEREUNDER. IN ADDITION, MICROCOM CORPORATION'S LIABILITY FOR WARRANTY CLAIMS SHALL NOT, IN ANY EVENT, EXCEED THE INVOICE PRICE OF THE PRODUCT CLAIMED TO BE DEFECTIVE. NOR SHALL MICROCOM CORPORATION BE LIABLE FOR DELAYS IN THE REPLACEMENT OR REPAIR OF PRODUCTS.





## **Appendix B: RMA Procedure**

### **Return Material Authorization (RMA) Procedure**

A Return Material Authorization (RMA) number must be obtained prior to the return of printers and/or materials to Microcom Corporation's Service Department. The purpose of the RMA number is to provide effective tracking and control of returned printers and/or materials. Microcom Corporation will not be responsible or held accountable for printers and/or materials returned without proper authorization.

#### **Shipping Charges:**

The return of printers and/or materials to Microcom Corporation for repair should be returned freight and insurance prepaid. Microcom Corporation will pay the return shipping charges (standard ground service) on all warranty repairs; expedited services will be paid at the customer's expense. The return of non-warranty repairs to printers and/or materials will be shipped by a shipping carrier and service determined by the customer.

#### **Receiving a Return Material Authorization (RMA) number:**

1. To receive an RMA number, either complete the online RMA request form located at Microcom's website ([www.microcomcorp.com](http://www.microcomcorp.com)) or contact the Microcom Corporation Service Department and provide the representative with the following information:
  - Company name.
  - Contact name and phone number.
  - Model number.
  - Printer serial number.
  - A detailed description of the problem.
  - Service option requested (1 Day, 3 Day, 5 Day, or Standard turnaround).
  - Purchase Order Number.
2. The shipping label should contain the following information:  
Microcom Corporation  
Attn: Service Dept. RMA# <place RMA number here>  
8220 Green Meadows Dr. N.  
Lewis Center, OH 43035 USA
3. Return the defective item(s) for repair to the address listed above, freight and insurance prepaid.
4. Upon receipt of an RMA number, the customer contact will be notified by a Microcom Corporation representative regarding repair charges, at which time the ship method will be determined. Items returned for repair with inadequate packaging material will be returned to the customer in Microcom Corporation approved packaging at the customer's expense.



## Glossary

**Alphanumeric** - A term used to identify characters consisting of letters, numbers, and other symbols (such as punctuation marks and mathematical symbols).

**Bar code** - Alphanumeric characters that are represented using a system of printed lines and can be read by a computer.

**Black-line** - A registration mark, typically a black line on the underside of certain media used to identify the starting position of a label.

**Blow-hole** - A registration mark, typically a notched or cutout in certain media used to identify the starting position of a label.

**Continuous media** - Media that contains no gap and continues as one piece of media.

**CTS (Clear to Send)** - A status signal from the printer to the host PC indicating when it is OK to send data to the printer. This signal is used in conjunction with RTS (Ready To Send). The PC (DTE) will only transmit to the printer (DCE) when it sees CTS up. CTS leaves the printer on pin #8 of the RS-232 connector.

**Cutter** - An optional device, mounted on the printer, which is used to cut media into custom sized labels after printing

**DCD (Data Carrier Detect)** - A status signal from the printer to the host PC that tells the PC (DTE) that the printer is powered up. This signal is +5Vdc when the printer is turned ON. DCD leaves the printer on pin #1 of the RS-232 connector.

**DCE (Data-Circuit-terminating Equipment)** - The modem or printer end of an RS-232 serial communication link. Modem serial ports and other peripherals are typically configured as DCE.

**Die-cut media** - Media that is cut using a die to form individual labels that have a start and stop point. Typically the excess material surrounding the label is removed from the backing material.

**Direct thermal** - Method of printing with a special heat-sensitive media that directly contacts heat elements of a thermal print head. (See *Thermal print head*)

**DPI (Dots Per Inch)** - A unit of measure term used to identify the print resolution capability.

**Drive roller** - Platen roller that is located below the print head that is used to drive media through the printer.

**DSR (Data Set Ready)** - A status signal from the printer (DCE) to the host PC (DTE) telling the PC that the printer is powered up. Used in conjunction with DTR. Microcom Corporation does not use this signal.

**DTE (Data Terminal Equipment)** - The terminal or computer end of an RS-232 serial communication link. Serial ports on computers are typically configured as DTE.

**DTR (Data Terminal Ready)** - A status signal used to provide information about the status of the communication line connected to the DCE end of an RS-232 link. Used in conjunction with DSR. Microcom Corporation does not use this signal.

**Ethernet** - A fast and capable serial interface used by many networks for connecting host computers to various peripherals.

**Fanfold media** - Die-cut or tag media that is folded into stacks.

**Flash memory** - Memory that is used to store font, graphics and label formats for faster access. This is a non-volatile type of memory, which means that the information stored in the memory chip is retained even when the printer power is turned off. The 428M printers use two FLASH memory chips: a CODE flash (256K x 16), and a FONT flash (4M x 16)

**GND (Signal Ground)** - The ground terminal of a power supply's output, and all points that connect to it. This is an essential signal in an RS-232 communication link that is used to reduce noise spikes that can cause a receiver to misread logic levels. Signal also known as SG and SGND.

**Guillotine Cutter** – A cutter that has a blade that cuts perpendicular to the media path. This type of cutter can be setup to make “partial cuts” which leave a small piece of label uncut in the center of the label. Not all Guillotine cutters can make partial cuts; a special blade is required. Cuts paper weights in the range of 60 – 100 gm/m<sup>2</sup>.

**LDS (Label Design Software)** - This is the resident control software language that is used to develop label formats and controls the full function of the printer.

**LPD (Label Present Detector)** - This sensor, when enabled, detects when media is present. This sensor is also referred to as a LTS (Label Taken Sensor). This sensor is typically a reflective type sensor that is normally mounted above the paper stock looking down at the paper just past the print head.

**Platen** - Roller that is located below the print head, which the media rests upon. (See *Drive roller*)

**Rolled media** - Media that has been rolled onto a core, typically cardboard in nature.

**Rotary Cutter** – A cutter that has multiple angled blades mounted to a shaft that cut media by rotating the shaft. This cutter only cuts in one direction, and cannot make “partial cuts”. The rotary cutter is typically used when heavy label stock must be cut because it has higher cutting force than the Guillotine cutter. Cuts paper weights in the range of 60 – 200g/m<sup>2</sup>.

**RS-232** - A popular and inexpensive asynchronous serial interface used for connecting host computers to various peripherals.

**RTS (Request To Send)** - A status signal from the host PC (DTE) to the printer (DCE) indicating when the PC has data to send to the printer. The printer (DCE) will only transmit data to the PC (DTE) when it sees RTS up. RTS comes into the printer on pin #7 of the RS-232 connector.

**RXD (Receive Data)** - An essential signal that carries data from the printer (DCE) to the host PC (DTE) for 2-way RS-232 serial communication. Signal is also known as RX and RD. RXD leaves the printer on pin #2 of the RS-232 connector.

**SDRAM (Synchronous Dynamic Random Access Memory)** – High density random access memory that is commonly used to store application code. The 324M & 424M printers do NOT use this type of memory.

**SRAM (Static Random Access Memory)** – High speed random access memory that is used to store label formats, graphics, and fonts temporarily. The slice buffer and serial buffer (10Kbyte) are also in SRAM. This is volatile memory, which means that the information is lost when the printer powers down. The 428M printers use a 512Kbyte SRAM configured as 256K x 16.

**Tag stock** - Media that typically has no adhesive backing, thicker in nature, and generally is a fanfold type media.

**Thermal print head** - A print head that uses thermal technology, to heat individual elements or dots to produce images. Also referred to as print head in this manual.

**TXD (Transmit Data)** - An essential signal that carries data from the host PC (DTE) to the printer (DCE) for 2-way RS-232 serial communication. Also known as TX and TD. This signal comes into the printer on pin #3 of the RS-232 connector.

**USB (Universal Serial Bus)** - A high-speed asynchronous serial interface that connects a PC to a peripheral, such as a printer. There are 3 versions of USB:

- 1) USB 1.0 transfers at 1M bits/second. (Hardly used at all anymore).
- 2) USB 1.1 transfers at 12M bits/second. (The 324 & 424 printers use this).
- 3) USB 2.0 transfers at 480M bits/second. (All newer PC's use this).



## This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.





