



MB200i Printer



SERVICE MANUAL

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WARNING

THE EQUIPMENT REFERENCED IN THIS DOCUMENT COMPLIES WITH THE REQUIREMENTS IN PART 15 OF FCC RULES FOR A CLASS B COMPUTING DEVICE. OPERATION OF THIS EQUIPMENT IN A RESIDENTIAL AREA MAY CAUSE UNACCEPTABLE INTERFERENCE TO RADIO AND TV RECEPTION.

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INTRODUCTION

- **About This Manual**
- **General Description**
- **Theory Of Operation**
- **Switches & Indicators**

ABOUT THIS MANUAL

This manual is laid out consistent with the product discussed and provides all of the information required for general printer configuration, troubleshooting, and maintenance. For specialized programming, refer to the Programming Manual located on the utility CD-ROM.

Step-by-step maintenance instructions are provided with typical problems and solutions. It is recommended that you become familiar with each section before installing and maintaining the printer.

This manual also incorporates the use of special information boxes. Examples of these boxes and the type of information provided in each, are below.

WARNING: PROVIDES INFORMATION THAT, IF UNHEEDED, MAY RESULT IN PERSONAL INJURY.

CAUTION: PROVIDES INFORMATION THAT, IF UNHEEDED, MAY RESULT IN EQUIPMENT DAMAGE.

NOTE: Provides helpful hints to assist in performing the tasks at hand.

A comprehensive Table Of Contents provided at the front of this manual facilitates rapid movement within. The contents identify the different unit sections and their respective sub-sections. Each references the page number of their commencement.

The pages of this manual has embedded headers and footers to assist the user in identifying his or her exact position within the manual. The header provides the section number followed by its name. The footer identifies the product on the left, the manual's part number in the center, and the page number to the right side of the page.

Page inumeration is two-part with each separated by a hyphen. The first character set references the section number and the second identifies the page number. Page numbers begin with the numeral (1) one at the commencement of a new section and ascends sequentially.

GENERAL DESCRIPTION

The MB200/201i are compact, transportable printers designed for frequent, but intermittent use. Their direct thermal print head not only allows high performance two-color printing (with special media), but also clear barcode printing.

Their ABS housing provides a durable, impact-resistant product. An integrated dispenser enables application of labels upon print. Rechargeable battery packs and a DC power transformer ensures operation anywhere, under any conditions. An automatic power off function turns the printers off after the last print.

THEORY OF OPERATION

When activated, the media is fed past the print head by an integrated drive train. The drive train is electric motor driven, coupled to a gear configuration located on the left side of the printer chassis. Kinetic energy is transferred to a platen roller which is the driving force of media movement. Paper guides within the chassis assembly ensure that the media remains properly positioned during the printing process and is fed unimpeded through an opening in the front.

A series of strategically located sensors sends signals to the processing unit. The processing unit in turn sends response signals to the various features based on programmed and received data. Correct signals initiates print head activity.

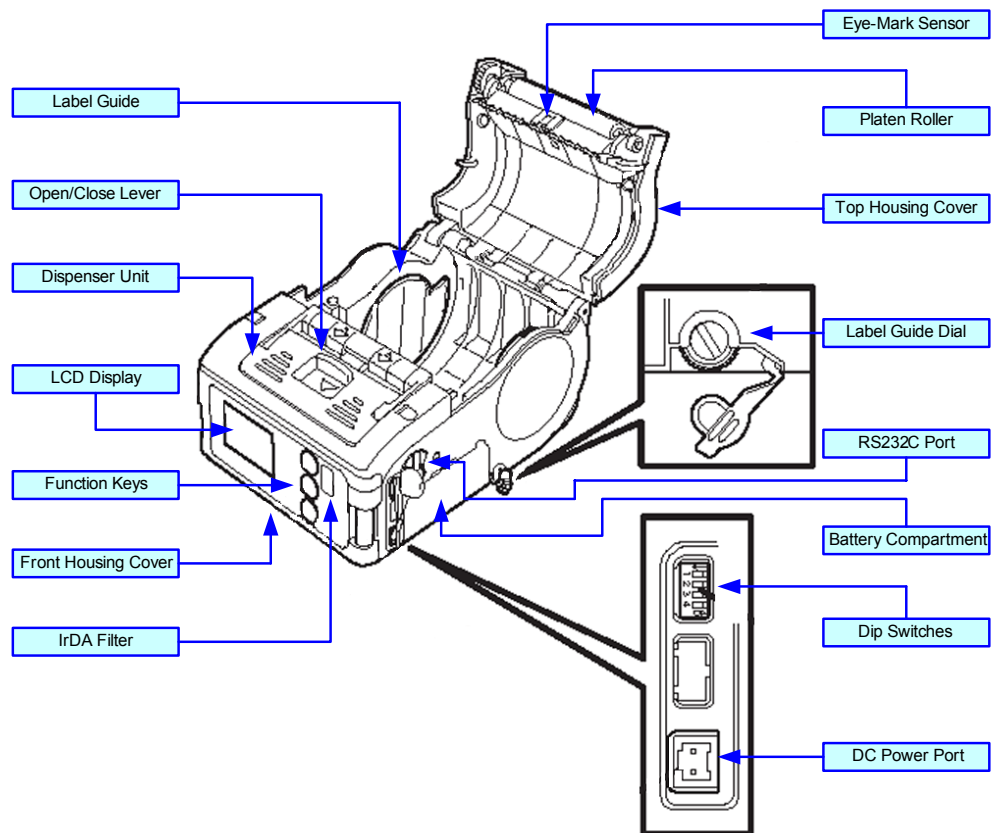


Figure 1-1, Primary Features & Components

SWITCHES AND INDICATORS

The table below identifies and defines printer switches and indicators for operator interface. The accompanying graphics display their locations and appearance

SWITCHES	
Power Button	Two position on/off switch that controls power flow to the system.
Print Button	Two position on/off button that activates and deactivates print action.
Feed Button	Two position on/off button that activates and deactivates feed action.
INDICATORS	
Charge LED	Indicates the resource level of the power pack.
Status LED	Indicates the systems' operational status.
DIP SWITCHES	
1 through 4	Various positions of the four accumulatively decides some printer configuration activities.

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TECHNICAL DATA

- **Physical Characteristics**
- **Enviromental**
- **Power**
- **Processing**
- **Sensing**
- **Regulatory Approvals**
- **Print**
- **Interface Modules**
- **Media**
- **Character Font Capabilities**
- **Barcode Capabilities**

PHYSICAL CHARACTERISTICS	
Height (maximum)	2.87 Inches (73 mm)
Width (maximum)	3.47 Inches (88 mm)
Depth (maximum)	5.04 Inches (128 mm)
Weight (maximum)	MB200i: 405 Grams (includes 105 grams for battery bag) MB201i: 390 Grams (includes battery)
Drop Specification	9.84 Feet (3.0 m) all six sides

ENVIRONMENTAL	
Operating Temperature	5° to 122°Fahrenheit (-15° to 50°C)
Storage Temperature	-13° to 140°Fahrenheit (-25° to 60°C)
Storage Humidity	30 to 90% RH Non-Condensing
Operating Humidity	30 to 80% RH Non-Condensing

POWER	
Print Capacity	Four rolls with full charge (equivalent of 48 meters). Continuous printing is permitted (provided print duty is 16% or less).
Battery	Lithium ion 7.4 volts, 2400mAh standard pack
AC Adapter	DC 9 Volt

PROCESSING	
CPU	32 Bit RISC
Flash ROM	2 Megabytes
Receive Buffer	12 Kilobytes

SENSING	
Gap/Dispense	Fixed
Reflective Eye-Mark	Fixed
Label	Fixed
Head-Open	Yes

REGULATORY APPROVALS	
Safety	UL 60950
EMC	FOC, Class B
Wireless LAN	R & TTE (FOC15B, FOC15C)
Bluetooth	R & TTE (FOC15B, FOC15C)

PRINT	
Method	Direct Thermal
Speed (maximum)	4.05 Inches Per Second (103 mm/s) (varies with print duty)
Print Module (dot size)	.0049 Inches (.125 mm)
Resolution	203 Dots Per Inch (8 dpmm)
Maximum Print Width	1.89 Inches (48 mm)
Maximum Print Pitch	6.30 Inches (160 mm)
Angle	0°, 90°, 180°, 270°

INTERFACE MODULES	
Serial Port	RS232C (9600 to 57,6000 dps) Standard Ready/Busy or X-On/X-Off Flow Control Bi-Directional Status
IrDA	Ir. Std., BHT, Ir Comm (3-wire cooked), Ir Obex (optional)
Ethernet	802.11B Wireless Wi-Fi (with built-in display)
Bluetooth	Version 1.1 Compliant

MEDIA	
Media Types	Super High Sensitive, Techno-Thermal A, Sythetic Paper Thermal C, Non-Sticky Thermal 64, Two-Color Thermal
Linerless Media	Standard (strong/weak adhesive)
Media Thickness	0.0025 to 0.0075 Inches (0.064 - 0.190 mm)
Roll Media Outside Diameter	2.64 Inches (67 mm +/- 0.5) MB200i only
Wound	Face In / Face Out. Face In is for linerless only.
Core Size	0.75 to 1.0 Inches (19.05-25.40 mm) internal diameter

CHARACTER FONT CAPABILITIES	
MATRIX FONTS	
XU Font	5 dots W x 9 dots H (Helvetica)
XS Font	17 dots W x 17 dots H (Univers Condensed Bold)
XM Font	24 dots W x 24 dots H (Univers Condensed Bold)
OA Font (OCR-A)	
OB Font (OCR-B)	
AUTO SMOOTHING FONTS	
WB	18 dots W x 30 dots H
WL	28 dots W x 52 dots H
XB	48 dots W x 48 dots H (Univers Condensed Bold)
XL	48 dots W x 48 dots H (Sans Serif)

CHARACTER CONTROL	
	Expansion up to 12 x in either the X or Y coordinates. Character Pitch Control Line Space Control Journal Print facility 0, 90, 180, and 270 Degree Rotation

BAR CODE CAPABILITIES	
Linear Bar Codes	UPC-A/E EAN-13/8 NW-7 (Codabar) Code 39 Code 93 Code 128 RSS-14 JAN/EAN ITF
Two Dimensional	QR Code Data Matrix Maxicode PDF417 Composite Symbology
Ratios	1:2, 1:3, 2:5, User definable bar widths
Bar Height	4 to 999 dots, User programmable
Rotation	0, 90, 180, and 270 Degrees
Sequential Numbering	Sequential numbering of both numerics and bar codes
Custom Characters	RAM storage for special characters
Expansion Ratio of Character	Height: 1-12 times, Width: 1-12 times
Graphics	Full dot addressable graphics, SATO Hex/Binary, .BMP or .PCX formats
Form Overlay	Form overlay for high-speed editing of complex formats

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INTERFACE SPECIFICATIONS

- **Interface Specifications**
- **AD-HOC Connectivity**

INTERFACE SPECIFICATIONS

This chapter presents the printer interface types and their specifications. These specifications include detailed information to assist in the selection of the most appropriate method for the printer to interface with the host. The acceptable interface methods are:

- 802.11B Wireless
- RS232C Serial
- Infrared Rays (IrDA)
- Bluetooth

Following the selection of the desired interface, proceed to the following unit for instructions on how to Configure the printer for that interface type.

WARNING: NEVER CONNECT OR DISCONNECT INTERFACE CABLES (OR USE A SWITCH BOX) WITH POWER APPLIED TO EITHER THE HOST OR THE PRINTER. THIS MAY CAUSE DAMAGE TO THE INTERFACE CIRCUITRY IN THE PRINTER/HOST AND IS NOT COVERED BY WARRANTY.

802.11B WIRELESS INTERFACE

802.11 refers to a family of specifications developed by the IEEE for wireless LAN technology to communicate between a wireless client and a base station or between two wireless clients. This interface only uses DSSS which allows wireless functionality comparable to Ethernet.

The wireless print server provides easy printer interface with 802.11b Wi-Fi compliant networks free of wired connections. Each printer is shipped with a Windows driver and interface installed. To print from a PC, the driver must be loaded and the PC must be configured to run one of the supported protocols.

Default Parameters: DSW1, 3, 4 OFF / DSW2 ON.

802.11B WIRELESS SPECIFICATIONS	
Variable Data Rates	11, 5.5, 2 and 1 Mbps
Frequency Band	2.4 GHz ISM Band
Wired Equivalent Privacy & WPA	WEP 128 bit, 64 bit (compatible with 40bit), WPA, 802.11x
Sensitivity	(typ, AAWGN, 8E-2 PER): -91dBm at 1Mbps, -88dBm at 2 Mdps, -87dBm at 5.5Mbps, -84dBm at 11Mbps.
Range	100m indoors, 300m outdoors
Protocols	TCP/IP, IPX/SPX, Direct Mode IPX/IP, DLC/LLC, NetBEUI, NetBIOS/IP

RS232C SERIAL INTERFACE

This interface is an industry standard for serially transmitting data using a wired cable. Separate transmit and receive lines enable data to flow in both directions simultaneously. Data transmitted using this protocol is defined in its parameters; baud/bps (speed), data bits, stop bit, parity, and hand-shaking method. To change the parameter settings, refer to the Programming Reference document for this product. The Programming Reference and a ready-made cable with DIN and DB9 connectors may be acquired from SATO.

Default Parameters: DSW1-4 OFF, 19200bps, 8 data bits, 1 stop bit, no parity.

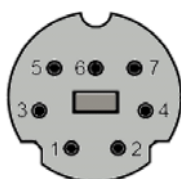


Figure 3-1, RS232 Male Connector Pin Assignments

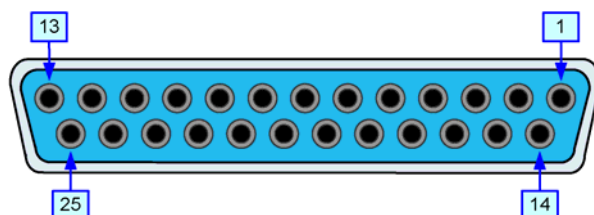


Figure 3-2, RS232 Female Connector Pin Assignments

READY/BUSY CABLE REQUIREMENTS					
DB9	DB25	HOST	DIRECTION	8-PIN	PRINTER
2	3	RD (Receive Data)	To Host	1	TD (Transmit Data)
3	2	TD (Transmit Data)	To Printer	6	RD (Receive Data)
8	5	CTS (Clear To Send)	To Printer DB9-6	2	RTS (Request To Send)
5	7	SG (Signal Ground)	Bi-Directional	7	SG (Signal Ground)
7	4	RTS (Request To Send)	To Host	5	CTS (Clear To Send)

RS232C SPECIFICATIONS	
Asynchronous ASCII	Half-duplex communication, Bi-Directional Communication
Data Transmission Rate	9600, 19200, 38400, 57600, 115200 bps
Data Length	8 bit (selectable)
Stop Bit	1 bit (fixed)
Parity Bit	ODD, EVEN, NONE (selectable)
Codes Used	ASC II Character Codes
Control Codes	STX (02h), ETX (03h), ACK (06h), NAK (15h)
Connector	8-pin mini - DIN
Cable (8-pin DIN to 9-pin host)	Call 704.644.1650
Signal Levels	High: +12V, -12V

INFRARED RAYS (IRDA)

Infrared communications is based on technology which is similar to entertainment remote control devices used in homes today. This technology offers a convenient, interoperable, low power, and reliable way to connect computer and printer without the use of cables. The half-duplex, serial data interconnection capabilities supports walk up point-to-point use.

The infrared transmission of print data is transferred from the terminal to the printer in four phases: (1) Connection, (2) Printer Status Check, (3) Data Transfer, (4) Disconnection.

The limitations of this interface type is that it requires a direct line of sight with a reading span of 30 degrees at a maximum distance of 7-8 inches (20cm). When the peripherals are aligned, they negotiate and transmit/receive data between the two devices.

Default Parameters: DSW1 ON / DSW2-4 OFF.

IRDA SPECIFICATIONS (STANDARD PROTOCOL)	
Baud Rate	9600, 19200, 38400, 57600, 115200
Data Bit Length	8
Stop Bit	1
Parity Bit	None, Odd, Even
Codes Used	ASC-II: 7 bit, Graphics: 8 bit.
Control Codes	STX (02h), SYN (16h), ETX (03h), DLE (10h)
Communication Time	Time-Out: 5.99 seconds, Retry: over 500 milliseconds.
Receiving Type	Single item.
Operations Mode	IrSIR v1.2

BHT protocol is the communication procedure used to transmit files between DENSO data collection devices by adopting the response method using the ACK/NAK codes defined for the use with these types of devices. Note the IrDA parameters must be set according to PDA/DCS methods and appropriately configured to direct data transmission to the printer. Refer to the IrDA command settings in the Programming Reference document for this printer, as well as, documentation provided by the manufacturer of the data collection device for the proper steps. The appropriate firmware must be installed to function.

IRDA SPECIFICATIONS (BHT PROTOCOL)	
Baud Rate	9600, 19200, 38400, 57600, 115200
Data Bit Length	8
Stop Bit	1
Parity Bit	None, Odd, Even
Codes Used	ASC-II: 7 bit, Graphics: 8 bit.
Control Codes	SOH (01h), STX (02h), ETX (03h), EOT (04h), ENQ (05h), ACK (06h), DLE (10h), NAK (15h).
Communication Time	Time-Out: 5.99 seconds, Retry: over 500 milliseconds.
Receiving Type	Single item.

The IrCOMM protocol runs on top of IrDA and supports the emulation of a peer device similar to what's connecting it by a serial or parallel cable for applications that access those ports through the operating system. Since various communication and printing applications utilize cables differently, cable emulation must account for those differences.

IRDA SPECIFICATIONS (IRCOMM PROTOCOL)	
Baud Rate	9600, 19200, 38400, 57600, 115200
Data Bit Length	8
Stop Bit	1
Parity Bit	None, Odd, Even
Codes Used	ASC-II: 7 bit, Graphics: 8 bit.
Control Codes	STX (02h), ETX (03h), ACK (06h), NAK (15h).
Communication Time	Time-Out: 5.99 seconds, Retry: over 500 milliseconds.
Receiving Type	Single item.
Operations Mode	3-wire cooked

IrOBEX is a communications protocol that facilitates the exchange of binary objects between devices and functions similar to HTTP in that a client uses a reliable transport to connect to a server to request or provide objects. The appropriate firmware must be installed for this to function.

This is a one-way communications protocol so therefore flow control and printer response are absent.

IRDA SPECIFICATIONS (IrOBEX PROTOCOL)	
Baud Rate	9600, 19200, 38400, 57600, 115200
Data Bit Length	8
Stop Bit	1
Parity Bit	None, Odd, Even
Codes Used	ASC-II: 7 bit, Graphics: 8 bit.
Control Codes	STX (02h), ETX (03h), ACK (06h), NAK (15h).
Communication Time	Time-Out: 5.99 seconds, Retry: over 500 milliseconds.
Receiving Type	Single item.

BLUETOOTH

Bluetooth is a short-range, wireless technology operating in the unlicensed 2.4GHz band and offers greater flexibility than IrDA. Its signal is broadcast omni-directional and transmits/receives up to a distance 30 feet (10 meters).

Typically, the data is directed through a Bluetooth assigned COM port on a PDA which handles all COM port protocols. Refer to the manufacturer's documentation PocketPC device setup.

Default Parameters: DSW1,3,4 OFF / DSW2 ON.

ALL INTERFACE TYPES

RECEIVE BUFFER

The data stream is received from the host to the printer one job at a time. This allows the software program to maintain control of the job print queue so that it can move a high priority job in front of ones of lesser importance.

The printer receives and prints one job at a time. If a print job exceeds the buffer size, transmission will be rejected by the printer. Error conditions that occur during the Print Data transmission will cause the printer to return a NAK.

ACK/NAK PROTOCOL

Bi-Directional ACK/NAK protocol is used for error control. In a normal transmission sequence when the transmission is received, the printer will return an ACK (06H) signifying that it was received without a transmission error. After the transmission command structure has been analyzed, a status byte is returned to the host. This status byte informs the host of the validity of the command structure.

If the command structure is error free, the printer proceeds with the print operation. When the print operation is completed, a Printer Status message is returned to the host. If an error was detected during the initial transmission sequence, a NAK (15H) will be returned signalling to the host that the received transmission contained errors and must be resent. If the returned Status byte indicates a command structure error, the error must then be corrected before the print data is resent to the printer.

A valid transmission to the printer must be bounded by an STX/ETX pair, with the STX (02H) signifying the start of the Print Data and ending with an ETX (03H) signifying the end.

AD-HOC CONNECTIVITY

To configure the printer for ad-hoc connectivity, an RS232 port and cable is initially required to use the Wireless Utility. The following two sections provides direction to the necessary tools, then procede to the next consecutive sections to begin setup.

NOTE: An 8-pin DIN to 9-pin RS232 cable may purchased from SATO.

MB200i WIRELESS LAN CONFIGURATION TOOL (v1.0.0)

The software may be downloaded from:

http://techsubweb.satoamerica.com/public/SAI_site/networking/MB/MB20xi_Cfgtool-setup.zip.

Once downloaded, unzip the package and run "setup.exe" to begin installation. Upon completion, procede as follows: Start/Programs/Sato Tools/LAN Config Tool.

MB200i DRIVER

The driver may be downloaded from: http://techsuweb.satoamerica.com/public/SAI_site/drivers/v4/SI_PORT.zip. Once downloaded, unzip the package and procede as follows: Control Panel/Printer and Faxes/Add a Printer. Make the necessary entries on this menu screen to install the MB200i driver.

PRINTER SETUP

Perform the following procedure to configure the printer for ad-hoc interface connectivity.

1. Ensure all of the necessary tools are present.
2. Set all dipswitches to the OFF position to place the printer in the serial mode.
3. Connect the serial cable to the printer and the applicable host computer.
4. Power on the printer.
5. At the host computer, access Control Panel, followed by MB200i folder, and then click on MB200i Printer Driver.
6. Procede to the SATO MB200i Properties screen (Figure 3-3a/b), then select the Ports tab.

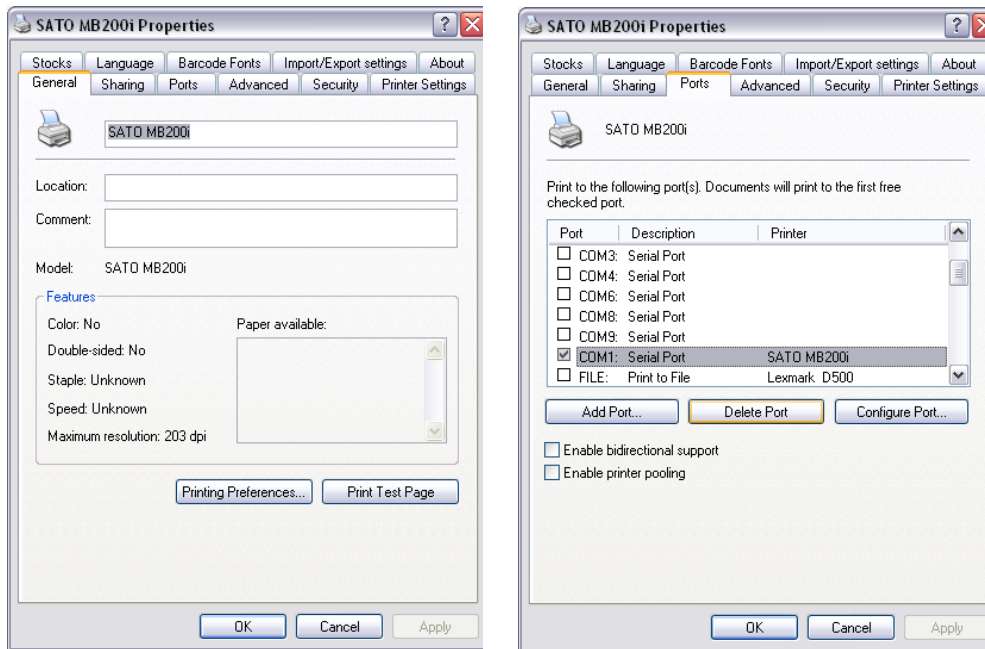


Figure 3-3a/b, SATO MB200i Properties

7. Check the COM1: Serial Port option to assign “SATO MB200i” to that port, then click on Apply.
8. On the same screen, click on the Configure Port button.
9. When the COM1 Properties screen appears, click on each drop-down menu to change the settings as follows: 19200 Bits Per Second, 8 Data Bits, no Parity, 1 Stop Bit, no Flow Control. (Figure 3-4)

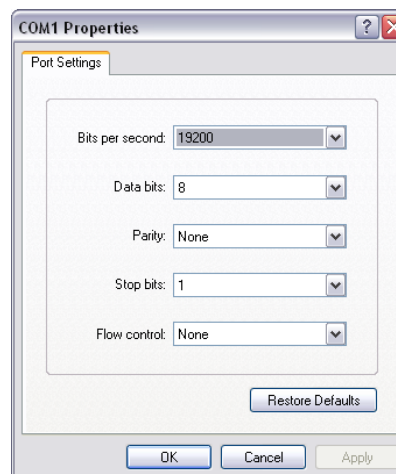


Figure 3-4, COM1 Properties

10. Click on the OK button to record the settings.
11. When the Properties screen appears, click on the OK button to record all settings.
12. When the main MB200i driver screen appears, click on its OK button.

13. Open the SATO MB200i Configuration Tool screen (Figure 3-5) and enter as follows:

- Select the Serial Port option for the interface type. Ensure COM1:19200,n,8,1 displays in the field to the right.
- IP Address: to 150.100.100.1, then press the SET button.
- Subnet Mask: to 255.255.255.0, then press the SET button.
- Gateway: to 0.0.0.0, then press the SET button.
- SSID: to MBPRINT, then press the SET button.
- Channel Number: to 11, then press the SET button.
- Operation Mode: to Ad-Hoc, then press the SET button.
- Security Mode: to Disable WEP, then press the SET button.
- Socket Port: to 9100, then press the SET button.

Figure 3-5, SATO MB200i Configuration Tool

14. Perform the following steps print a test label and verify the settings:

1. Power off the printer and change DSW2 to the ON position.
2. Press and hold the FEED button while powering on the printer. Release when indicators are on.
3. Press the FEED button again to print a test label. Press FEED again to stop.
4. Ensure the contents of the label match those settings of step 13.

15. Ensure the contents of the label match those settings listed in step 13.

16. Repeat steps 2 through 15 if there is a discrepancy between the two.

COMPUTER SETUP

Perform the following procedure to configure the host computer for AD-HOC interface connectivity.

1. At the host computer, access Control Panel and then Network Connections.
2. When the Network Connections screen (Figure 3-6) appears, ensure the icon to the left of “Wireless Network Connection” does not have a red X over it. Proceed to step 3 if so, exit if not.

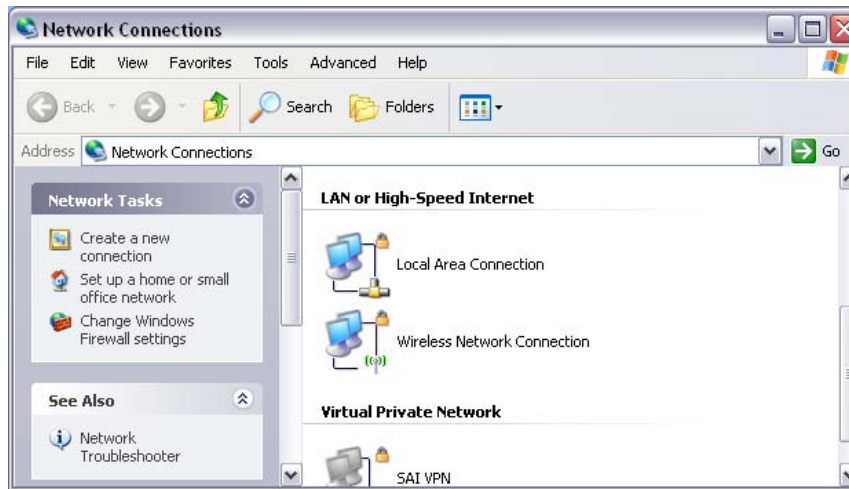


Figure 3-6, Network Connections

3. Click on the icon mentioned in step 2 to proceed to the Wireless Network Connection Properties screen (Figure 3-7a/b).
4. Click on the Wireless Networks tab to view that menu, then on the Advanced button.

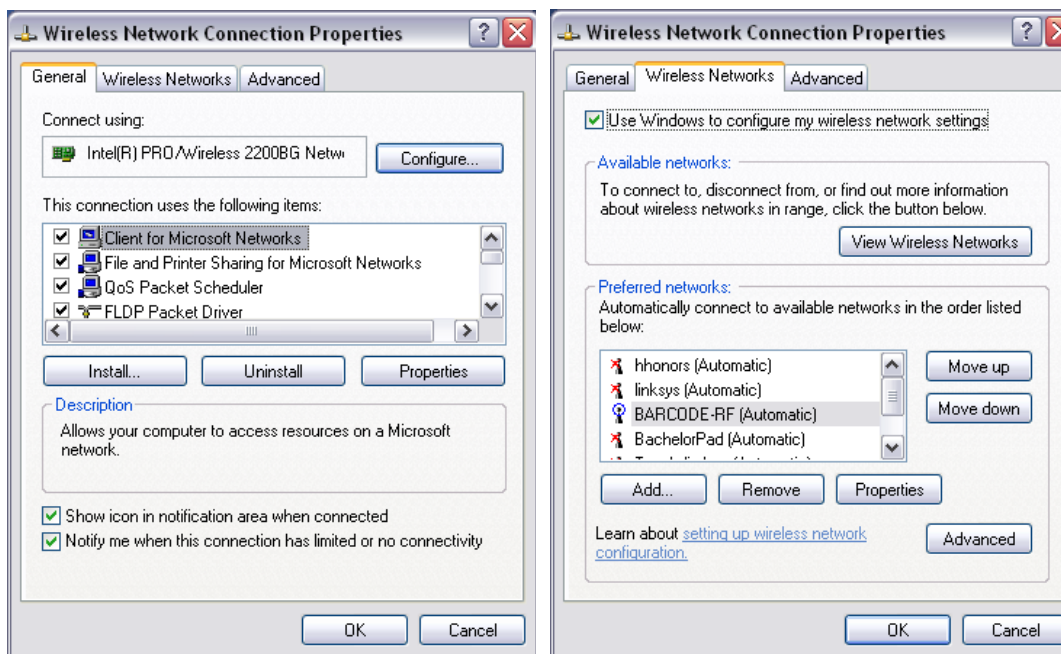


Figure 3-7a/b, Wireless Network Connection Properties

5. When the Advanced screen (Figure 3-8) appears, select the Computer-To-Computer option, followed by the Close button.

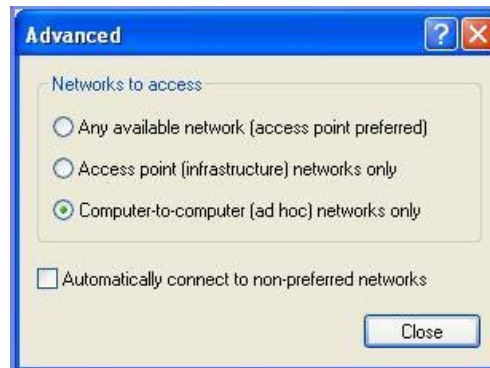


Figure 3-8, Advanced

6. When the Wireless Network Connection Properties Figure 3-9) screen reappears, click on the Add button to add a network matching that of the printer.

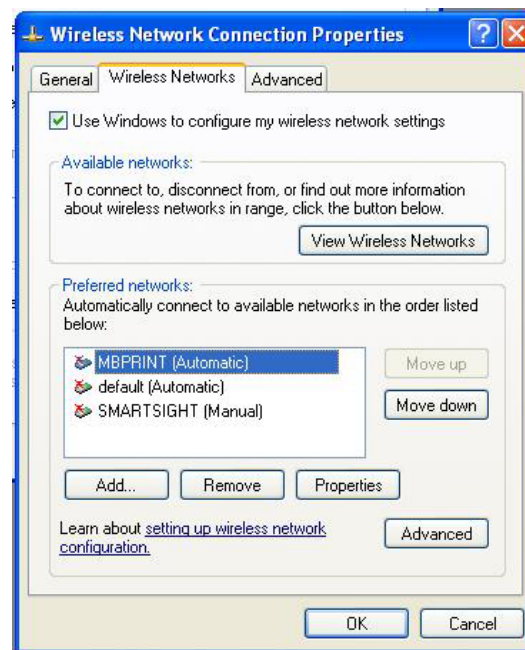


Figure 3-9, Wireless Network Connection Properties

7. When the Wireless Network Properties (Figure 3-10) screen appears, input MBPRINT in the Network Name (SSID) field.
8. Alter the following fields as necessary:
 - Network Authentication: Open.
 - Data Encryption: Disabled.
9. Press the OK button to enter the selections.

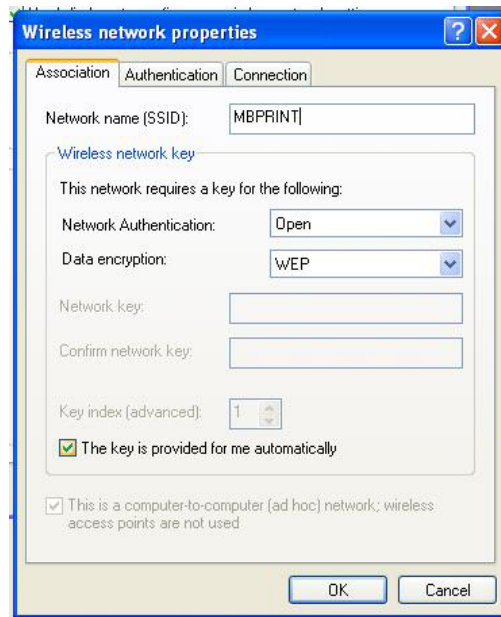


Figure 3-10, Wireless Network Properties

10. When the Wireless Network Connection Properties screen (Figure 3-9) appears, ensure that MBPRINT is displayed as the preferred network. If not, repeat steps 4 through 10.
11. Click on the General tab to view that menu.
12. Scroll the “This connection uses” field to view the Internet Protocol (TCP/IP) option and select it.
13. When the Internet Protocol (TCP/IP) Properties screen (Figure 3-11) appears, select the “Use the following IP address” option to activate those items.

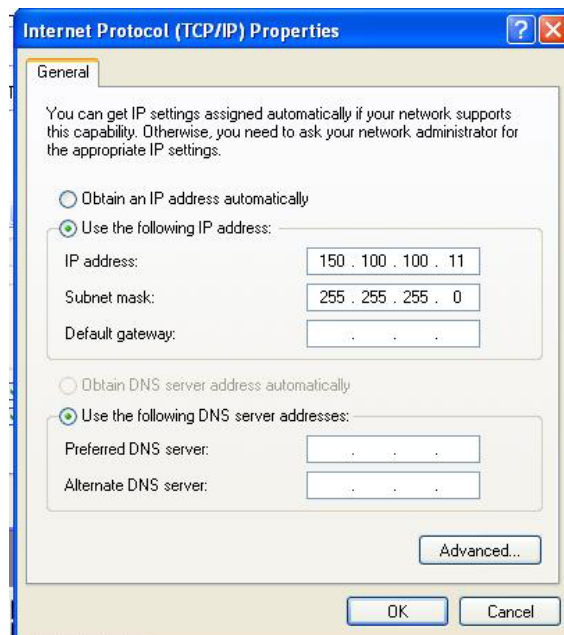


Figure 3-11, Internet Protocol (TCP/IP) Properties

14. Alter the following fields as necessary:
 - IP Address: Change to 150.100.100.11 .
 - Subnet Mask: 255.255.255.0 (should always be the same)
15. Click on the OK button to exit the Internet Protocol (TCP/IP) screen.
16. When the Wireless Network Connection Properties screen (Figure 3-9) reappears, click on the OK button to exit.
17. To test the ad-hoc wireless connection, perform the following procedure:
 1. Access Control Panel/MB200i Print Driver/Printer and Faxes, then click on MB200i Printer Driver.
 2. When SATO MB200i Properties screen (Figure 3-12a) appears, select Ports tab.
 3. When the Ports menu (Figure 3-12b) appears, click on the Add Port button.

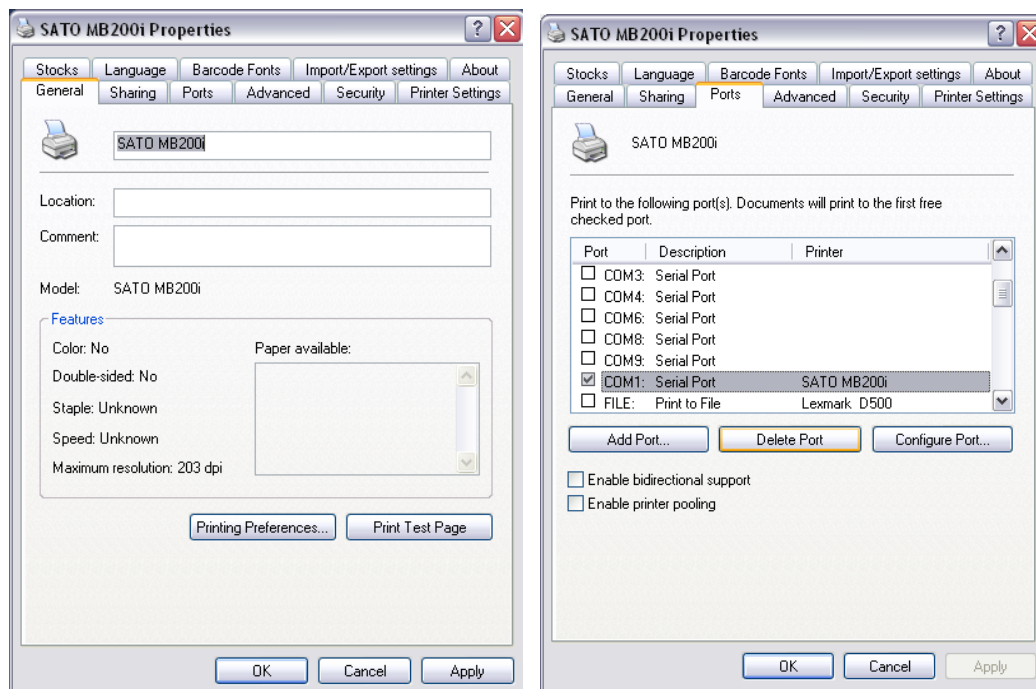


Figure 3-12a/b, Ports

4. When the Printer Ports screen (Figure 3-13) appears, select the Standard TCP/IP Port option followed by the New Port button.



Figure 3-13, Printer Ports

5. When the TCP/IP Wizard welcome screen (Figure 3-14) appears, press the Next button.



Figure 3-14, TCP/IP Wizard Welcome Screen

6. Input the same IP Address as the printer in the field adjacent to the Printer Name/ IP Address prompt. Press the Next button. (Figure 3-15)

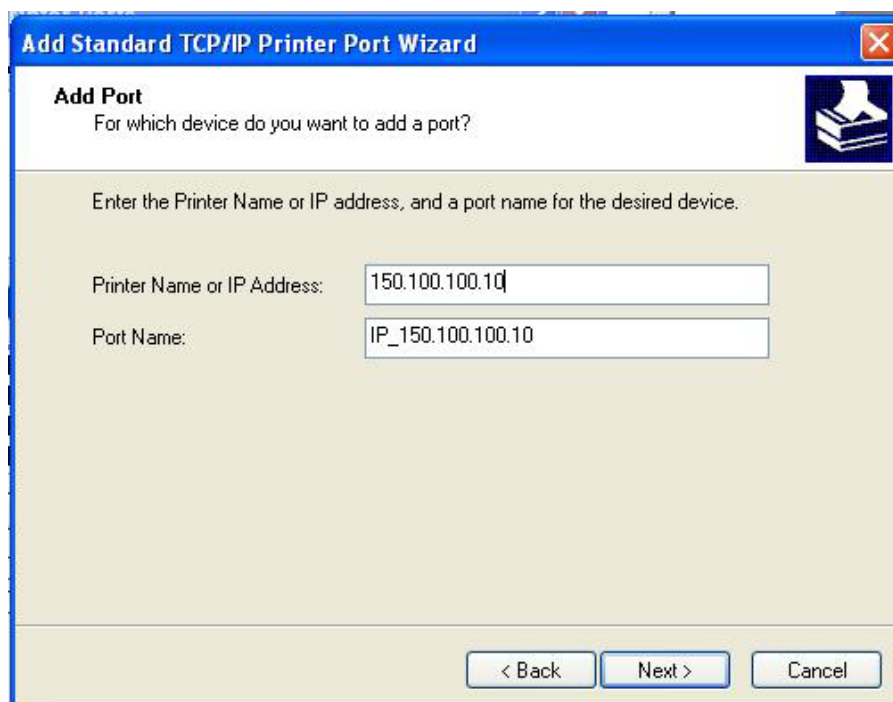


Figure 3-15, TCP/IP Wizard Entry Screen

7. Press the Finish button when the TCP/IP Wizard exit screen (Figure 3-16) appears.

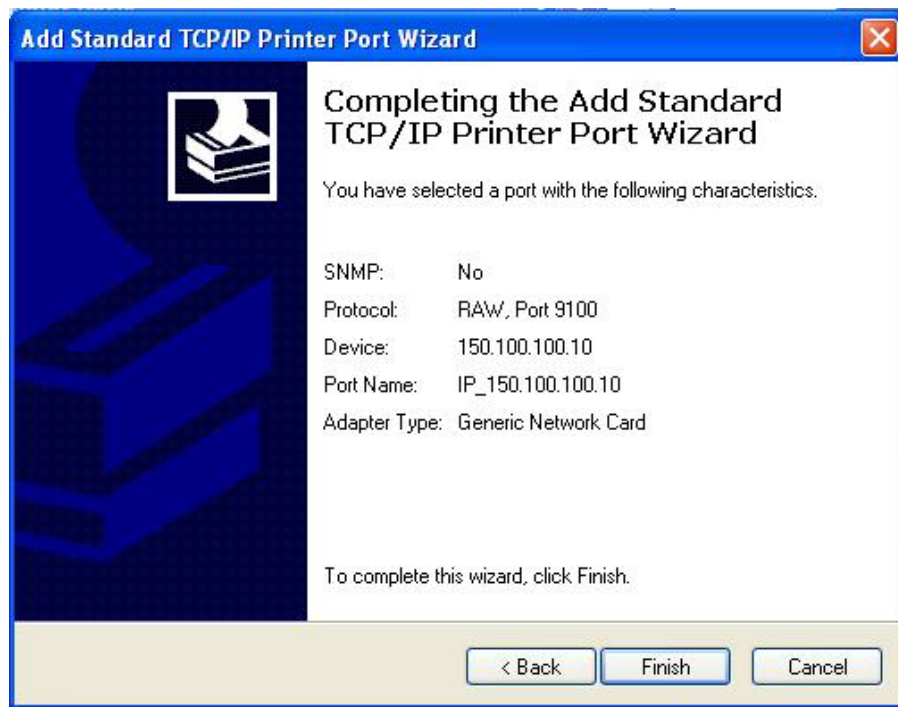


Figure 3-16, TCP/IP Wizard Exit Screen

18. At the SATO MB200i Properties screen, ensure the following is displayed:
 - Port: IP Address of the printer.
 - Description: Standard TCP/IP
 - Printer: MB200i
19. At the SATO MB200i Properties screen (Figure 3-17), press the Print Test Page button to print a test label.
20. Press the Apply button, followed by the OK button, to exit the SATO MB200i Properties screen.

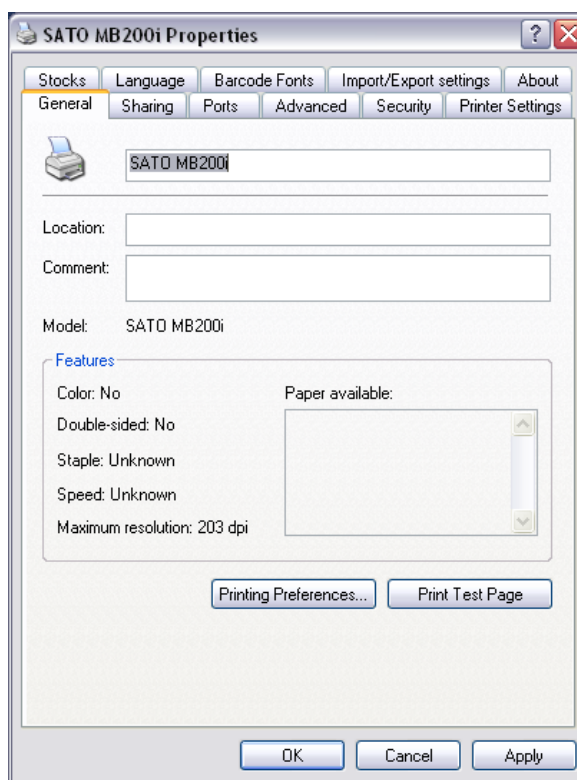


Figure 3-17, SATO MB200i Properties

4

LCD DISPLAY

- **Display Fields**
- **LCD Screens**
- **Maintenance Mode**

DISPLAY FIELDS

The LCD Display is an intergrated purchase option only and applicable only for the Wireless LAN and interface. Due to its limited application, this is the only unit within this manual that covers the LCD display. All of its features, functions, and menus are identified and defined here.

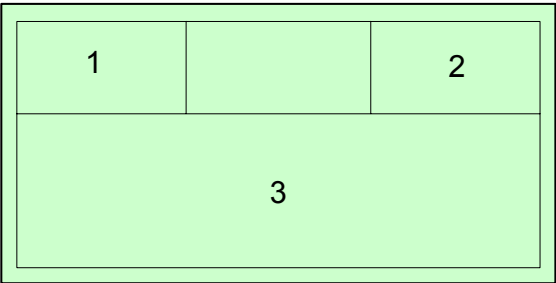


Figure 4-1, LCD Display

The LCD has three field areas of display; two graphical and one for text. They are as follows:

- 1. Graphical Battery charge status.
- 2. Graphical Electrical field strength for the Wireless LAN.
- 3. Text Two text lines showing the printer’s status.

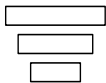
BATTERY LEVEL (1)

The battery charge of the printer’s power pack is displayed in four graduations as identified in the table below. The battery charge will always be displayed in field 1 as shown in Figure 4-1 above.

ICON	DESCRIPTION
	Displays a full charge of 8.0 volts or more.
	Displays the detected voltage is between 7.8 and 7.9.
	Displays the detected voltage is between 7.6 and 7.7. The printer will go into the Sleep Mode and the LED will blink every 4 seconds.
	Displays the detected voltage level is less than 7.5. The printer will automatically power off 30 seconds after displaying this icon.

WIRELESS FIELD STRENGTH (2)

When the Wireless LAN has been set, the received electric field strength will be displayed using one of the following four icons. The field strength will always be displayed in field 2 as shown in Figure 4-1 above.

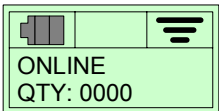
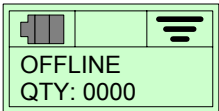
ICON	DESCRIPTION
	Maximum Strength.
	Medium Strength.
	Minimum Strength.
	No Strength.

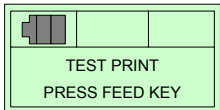
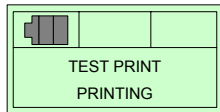
OPERATIONAL STATUS (3)

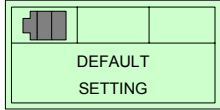
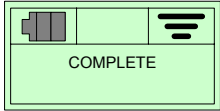
The printer's operational status is displayed in text form and will always be located in field 3 as shown in Figure 4-1 above. The following tables identify and define each of the LCD screens within the operational and maintenance menus.

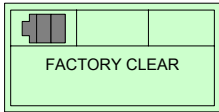
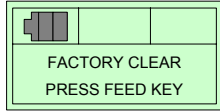
LCD SCREENS

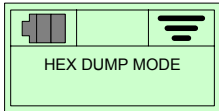
STARTUP		
STATUS	LCD	DETAIL
Formatting		Displays the SATO logo and the phrase "Farm Version" (Farm Ware Version) for a second upon startup.

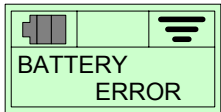
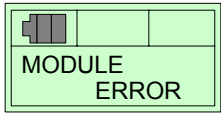
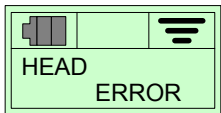
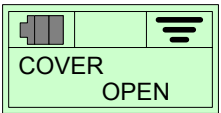
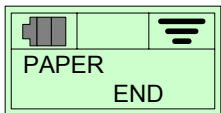
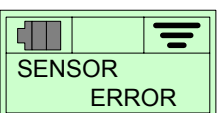
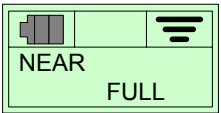
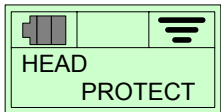
NORMAL MODE		
STATUS	LCD	DETAIL
Online		Displays the operational condition in the first line and the remaining print quantity in the second.
Offline		Displays the operational condition in the first line and the remaining print quantity in the second.
Sleep Mode	Not Available.	Nothing is displayed while in the sleep mode.

TEST PRINT MODE		
STATUS	LCD	DETAIL
Pausing Test Printing		Displays the current mode to be performed. Electric field strength icon for Wireless LAN is not displayed.
Test Printing		Displays the current mode and that the function has been completed. Electric field strength icon for Wireless LAN is not displayed.

DEFAULT SETTING MODE		
STATUS	LCD	DETAIL
Default Setting		Displays the current mode to be performed. Electric field strength icon for Wireless LAN is not displayed.
Default Setting Completed		Displays the current mode and that the function has been completed. Electric field strength icon for Wireless LAN is not displayed.

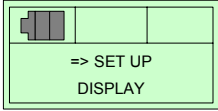
FACTORY CLEAR MODE		
STATUS	LCD	DETAIL
Factory Clear		Displays the current mode to be performed. Electric field strength icon for Wireless LAN is not displayed.
Factory Clear Completed		Displays the current mode and that the function has been completed. Electric field strength icon for Wireless LAN is not displayed.

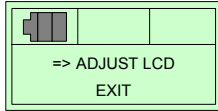
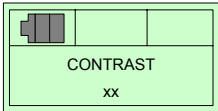
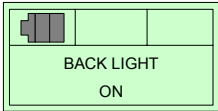
HEX DUMP MODE		
STATUS	LCD	DETAIL
Hex Dump		Displays the current mode to be performed. Electric field strength icon is only displayed if Wireless LAN is set as the interface type.

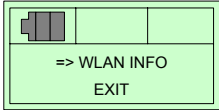
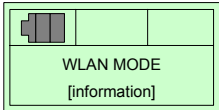
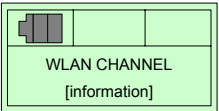
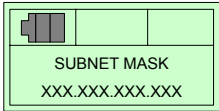
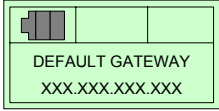
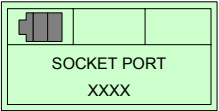
PRINTER ERRORS		
STATUS	LCD	DETAIL
Low Battery		Displays location of error. The battery icon will display a low charge condition and blink. The electric field strength icon will only be displayed if Wireless LAN is set as the interface type.
Module Error		Displays location of error. This will indicate an error was detected in the Wireless LAN or Bluetooth interface as applicable. The electric field strength icon will only be displayed if Wireless LAN is set as the interface type.
Head Error		Displays location of error. This will indicate an error was detected with the print head. The electric field strength icon will only be displayed if Wireless LAN is set as the interface type.
Cover Open		Displays location of error. This will indicate the top housing cover is not latched. The electric field strength icon will only be displayed if Wireless LAN is set as the interface type.
Paper End		Displays location of error. This will indicate that the paper supply is exhausted. Reload. The electric field strength icon will only be displayed if Wireless LAN is set as the interface type.
Sensor Error		Displays location of error. This will indicate an error was detected with a sensor. Troubleshoot. The electric field strength icon will only be displayed if Wireless LAN is set as the interface type.
Buffer Near Full		Displays location of error. This will indicate the receive buffer is at capacity. The electric field strength icon will only be displayed if Wireless LAN is set as the interface type.
Head Protect		Displays location of error. This will indicate the status of the head protect feature. The electric field strength icon will only be displayed if Wireless LAN is set as the interface type.

MAINTENANCE MODE

The Maintenance Mode allows for the Wireless LAN to be configured and/or the LCD Display. While in this mode, the PRINT key is used for option selection and the FEED key serves to enter the selection.

MAINTENANCE MODE		
STATUS	LCD	DETAIL
Initial Screen		Allows the selection of whether to setup the Wireless LAN interface or to modify the LCD display.

LCD SETUP		
STATUS	LCD	DETAIL
Setup menu		Allows the selection of whether to modify the LCD display or to exit. If EXIT is chosen, the display will return to the initial screen of the Maintenance Mode. Electric field strength icon for Wireless LAN is not displayed.
Contrast Adjustment		Allows the adjustment of the LCD contrast. Electric field strength icon for Wireless LAN is not displayed.
Backlight Setting		Allows the adjustment of the LCD backlighting. Electric field strength icon for Wireless LAN is not displayed.

WIRELESS LAN		
STATUS	LCD	DETAIL
Setup Menu	 The LCD screen displays a menu with two options: "=> WLAN INFO" and "EXIT".	Allows the selection of whether to setup the wireless LAN or to exit. If EXIT is chosen, the display will return to the initial screen of the Maintenance Mode.
Wireless LAN Mode	 The LCD screen displays "WLAN MODE" followed by "[information]" on the next line.	Socket Port Number is displayed.
Channel	 The LCD screen displays "WLAN CHANNEL" followed by "[information]" on the next line.	Channel information is displayed.
IP Address	 The LCD screen displays "IP ADDRESS" followed by "XXX.XXX.XXX.XXX" on the next line.	Current IP Address is displayed.
Subnet Mask	 The LCD screen displays "SUBNET MASK" followed by "XXX.XXX.XXX.XXX" on the next line.	Current subnet mask is displayed.
Gateway Address	 The LCD screen displays "DEFAULT GATEWAY" followed by "XXX.XXX.XXX.XXX" on the next line.	Gateway address is displayed.
Socket Port Number	 The LCD screen displays "SOCKET PORT" followed by "XXXX" on the next line.	Socket Port Number is displayed.

5

PRINTER CONFIGURATION

- **Printer Configuration**
- **Configuration Modes**

PRINTER CONFIGURATION

The keys of the operator panel and dip switches are used either singularly or in conjunction to perform configuration activities. The dip switch complex is accessible from the right housing cover.

Refer to the Control Features chapter of the Introduction Unit for identification of specific interface features.

FACTORY DEFAULTS			
DSW1	DSW2	DSW3	DSW4
OFF	OFF	OFF	OFF

RS232C QUICK REFERENCE TABLE							
DESCRIPTION	DIP SWITCHES				HEAD	PRINT KEY	FEED KEY
Standard Start-Up	OFF	OFF	OFF	OFF	Closed	OFF	OFF
User Test Print					Closed	OFF	ON
Default Reset					Opened	ON	OFF
Hex Dump	OFF	OFF	ON	ON	Closed	OFF	OFF
Font Download	OFF	OFF	OFF	ON	Closed	OFF	OFF
Dispense Auto Print					Opened	ON	OFF
Dispense Manual Print					Opened	OFF	OFF
Program Download	OFF	OFF	ON	OFF	Closed	OFF	OFF
Factory Clear (w/o counter)					Opened	ON	ON
Head Check	OFF	ON	OFF	ON	Opened	ON	OFF
Cancel Head Check					Opened	OFF	ON
Factory Clear (w'counter)	OFF	ON	ON	OFF	Opened	ON	ON

IRDA QUICK REFERENCE TABLE							
DESCRIPTION	DIP SWITCHES				HEAD	PRINT KEY	FEED KEY
Standard Start-Up	ON	OFF	OFF	OFF	Closed	OFF	OFF
User Test Print					Closed	OFF	ON
Hex Dump	ON	OFF	ON	ON	Closed		OFF
Head Check	ON	OFF	OFF	ON	Opened	ON	OFF
Cancel Head Check					Opened	OFF	ON
Factory Clear (w/counter)	ON	OFF	ON	OFF	Opened	ON	ON
Online Command (MB200)	ON	ON	ON	ON	Opened	ON	OFF
Online Command (SBPL)					Opened	OFF	ON

BLUETOOTH QUICK REFERENCE TABLE							
DESCRIPTION	DIP SWITCHES				HEAD	PRINT KEY	FEED KEY
Normal Mode	OFF	ON	OFF	OFF	Closed	OFF	OFF
User Test Print Mode					Opened	OFF	ON
Maintenance Mode					Opened	ON	OFF
Hex Dump	OFF	ON	ON	ON	Closed	OFF	OFF
Enable CRC (Digit Check)	OFF	OFF	OFF	ON	Closed	OFF	OFF
Disable CRC (Digit Check)					Opened	ON	OFF
Set Head Check	OFF	ON	OFF	ON	Opened	ON	OFF
Cancel Head Check					Opened	OFF	ON
Factory Clear (w/head clear)	OFF	ON	ON	OFF	Opened	ON	ON

WIRELESS LAN QUICK REFERENCE TABLE							
DESCRIPTION	DIP SWITCHES				HEAD	PRINT KEY	FEED KEY
Normal Mode	OFF	ON	OFF	OFF	Closed	OFF	OFF
User Test Print Mode					Opened	OFF	ON
Maintenance Mode					Opened	ON	OFF
Hex Dump	OFF	ON	ON	ON	Closed	OFF	OFF
Enable CRC (Digit Check)	OFF	OFF	OFF	ON	Closed	OFF	OFF
Disable CRC (Digit Check)					Opened	ON	OFF
Set Head Check	OFF	ON	OFF	ON	Opened	ON	OFF
Cancel Head Check					Opened	OFF	ON
Factory Clear (w/head clear)	OFF	ON	ON	OFF	Opened	ON	ON

CONFIGURATION MODES

This chapter provides an overview of the various configuration modes of the operation menu. All of the following configuration activities are performed via the use of the operator panel located on the printer front. However, many settings may also be controlled via software commands. In the case of conflict between the software and control panel settings, the printer will always use the last entered valid setting.

NORMAL MODE

When in the Normal Mode the printer is online and ready for print activity. If print activity, downloading, or other interaction does not occur, the printer will go into the Sleep Mode and from there, into the Offline Mode.

Refer to Figure 1-1 in the Introduction unit of this manual for dipswitch location.

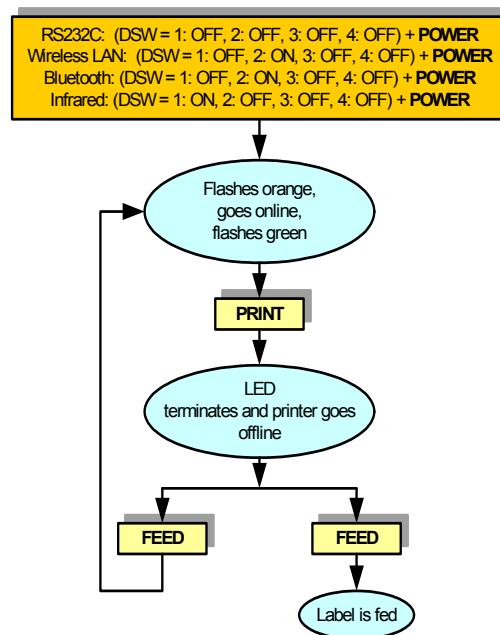


Figure 5-1, Normal Mode

LABEL SENSOR SELECTION

This function allows for the determination of the sensor to be used to control label positioning relative to the media type that will be used. The two options are; eye-mark and gap. This selection can only be made through host interface using a RS232C cable.

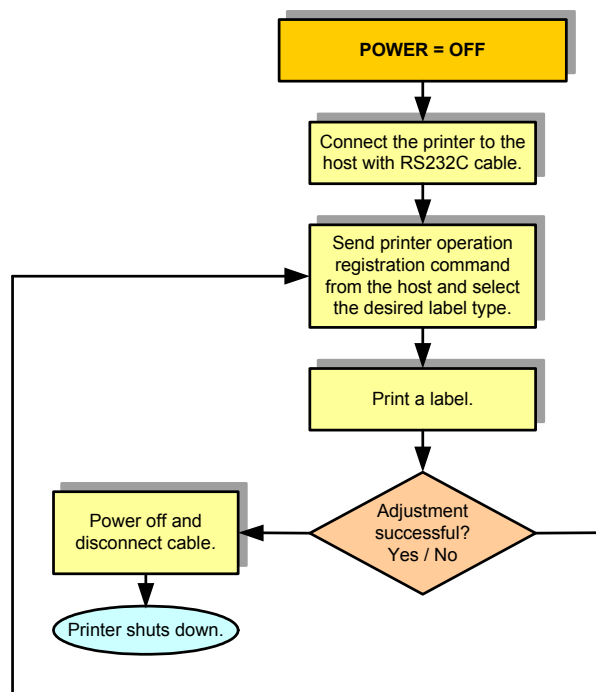


Figure 5-2, Label Sensor Selection

DISPENSE MODE

This feature allows for the determination of the method of dispense.

AUTO

Prints a single label after receiving data, waits for the label to be retrieved, then automatically prints the next label.

MANUAL

Prints a single label after receiving data and then goes offline. Prints a single label each time the PRINT key is pressed until the specified number of labels has been printed. A new job will have to be downloaded to print more.

Refer to Figure 1-1 of the Introduction unit in this manual for dipswitch location.

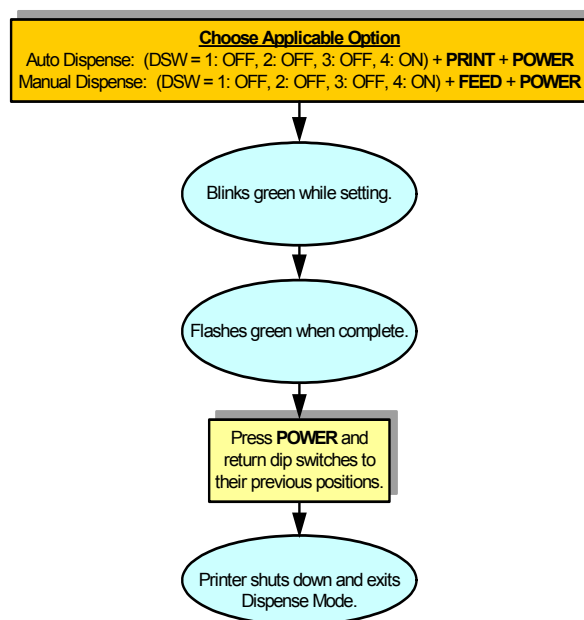


Figure 5-3, Dispense Mode

DOWNLOAD MODE

This download feature allows the operator to download print jobs to the printer. The data is received through an RS232C interface in binary form using XMODEM protocol for file transfer.

Refer to Figure 1-1 of the Introduction unit in this manual for dipswitch location.

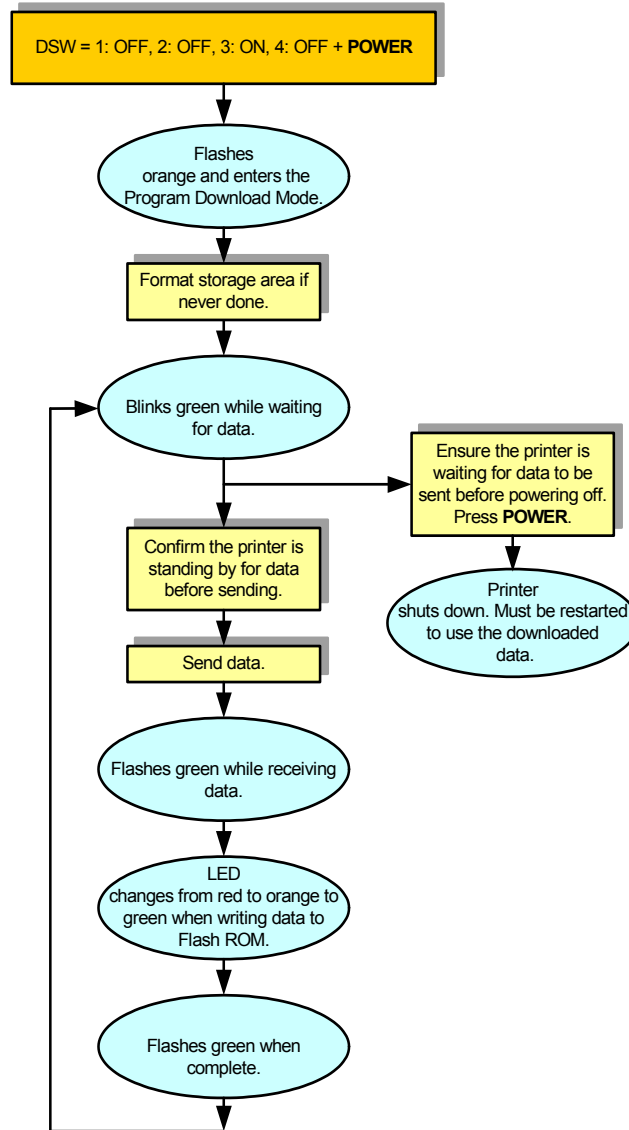


Figure 5-4, Program Download Mode

In XMODEM protocol, data is transferred block by block. Each starts with SOH(01h) and consists of 132 bytes such as block number (BLK) of 1 byte, complement of block number (_BLK), 128 bytes main data, and check sum (SUM) of 1 byte.

The block number starts from 1, and when counting to 255, the number goes back to 0 again. If the block number is [01h], complement of block number becomes [FEh]. In the main data, the section of data by 128 bytes is stored. SUM is the check sum computed from 128 bytes of main data.

NOTE: The above method is XMODEM (check sum) option. Select check sum option in the XMODEM settings on the host side.

When downloading data, the format is such that the first 16 bytes are used as header information and the rest is considered as data. The header information is divided thusly: code (4 bytes), start address (4 bytes), file size (4 bytes), and reserved area (4 bytes). The remaining optional data is to be stored in Flash ROM.

The basic sequence of XMODEM is to transfer data blocks by individually checking response blocks. NAK (15h) transmission by the receiving end initiates the sequence, and the sending end sends the first data block after receiving NAK. The receiving end receives and checks this data block, and then returns ACK (06h) in case of no error or NAK (15h) in case of an error. The sending end sends the next block when receiving ACK, and resends the same block when receiving NAK. This process repeats to the first block. EOT (04h) is sent from the sending end to receiving end at the end of all data transmission. After receiving EOT (04h), the receiving end returns ACK to terminate the sequence.

FONT DOWNLOAD MODE

A flash ROM is used to internally store and delete font data and custom designed data. The storage capacity for custom designed characters is a maximum of 95 for each of type of 16 x 16, 22 x 22, 24 x 24 dots.

There are four transmission protocols for font download: (1) Download Font Storage, (2) Download Font Selection, (3) Download Font Information Acquisition, (4) Storage Custom-Designed Character. The return status from the printer is set between STX (02h) and ETX (03h), and transferred in 3 bytes.

Wiring on the computer side may require a CTS (pin 5) and RTS (pin 4) cable connection. Confirm the host settings before downloading.

Figure 5-5 provides the specific sequence of events required by the operator, the printer, and the printers software for font download mode to be activated.

Refer to Figure 1-1 of the Introduction unit in this manual for dipswitch location.

A detailed description of how to download data is in the Programming Reference.

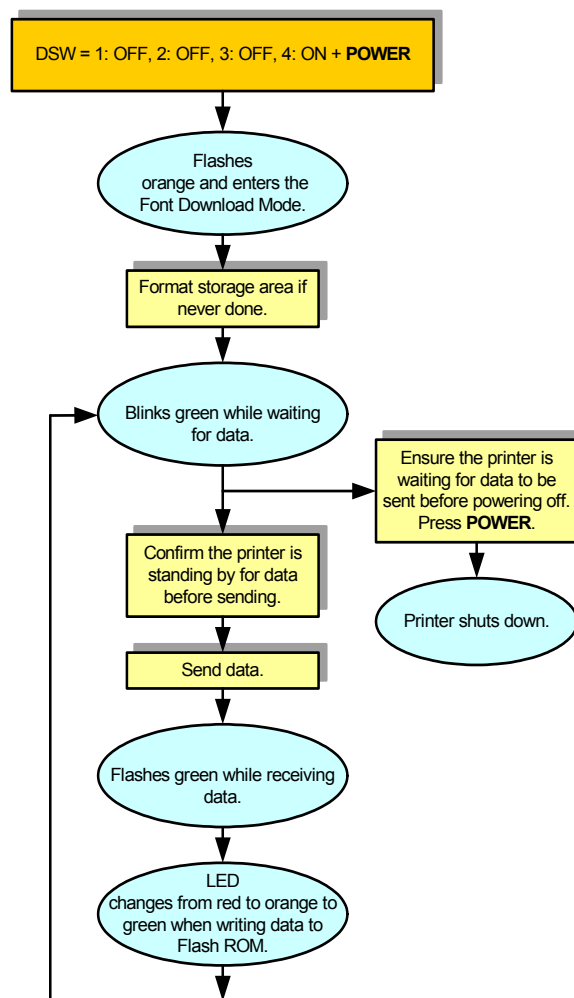


Figure 5-5, Font Download Mode

DOWNLOAD FONT REGISTRATION			
STATUS DESCRIPTION	ACSII	HEX	TRANSFER
Not Already Stored	A	41	Printer to Host
Already Stored	B	42	Printer to Host
Storage Area NG	N	4E	Printer to Host
Store Font	0	30	Host to Printer
Do Not Store Font	1	31	Host to Printer
Ready For Storage Status	O	4F	Printer to Host
Font Storage Completed Normally	E	45	Printer to Host
Font Storage Cancelled	S	53	Printer to Host
Font Storage Completed Abnormally	Z	5A	Printer to Host

DOWNLOAD FONT DELETION			
STATUS DESCRIPTION	ACSII	HEX	TRANSFER
Not Already Stored	A	41	Printer to Host
Already Stored	B	42	Printer to Host
Delete Font	0	30	Host to Printer
Do Not Delete Font	1	31	Host to Printer
Font Deletion Completed Normally	E	45	Printer to Host
Font Deletion Cancelled	S	53	Printer to Host
Font Storage Completed Abnormally	Z	5A	Printer to Host

DOWNLOAD FONT INFORMATION AQUITION			
STATUS DESCRIPTION	ACSII	HEX	TRANSFER
Not Already Stored	A	41	Printer to Host
Already Stored	B	42	Printer to Host
Font Information Transferred OK	0	30	Host to Printer
Number of Transferred Data	000000-999999	6 bytes w/ 30-39	Printer to Host
Font Information	Font Info Data + Font Data Info		Printer to Host

STORAGE OF CUSTOM DESIGNED CHARACTER			
STATUS DESCRIPTION	ACSII	HEX	TRANSFER
Storage Ready Status	O	4F	Printer to Host
Storage Completed Normally	E	45	Printer to Host
Storage Completed Abnormally	Z	5A	Host to Printer

ONLINE COMMAND MODE

This function allows the selection of receiving command by using either standard SATO Barcode Printer Language (SBPL) or first generation MB200 compatible commands. The MB200 compatible command option should only be chosen if first generation MB200's will be used along with the newer generation. This will provide a common command language that will communicate to both.

Refer to Figure 1-1 of the Introduction unit in this manual for dipswitch location.

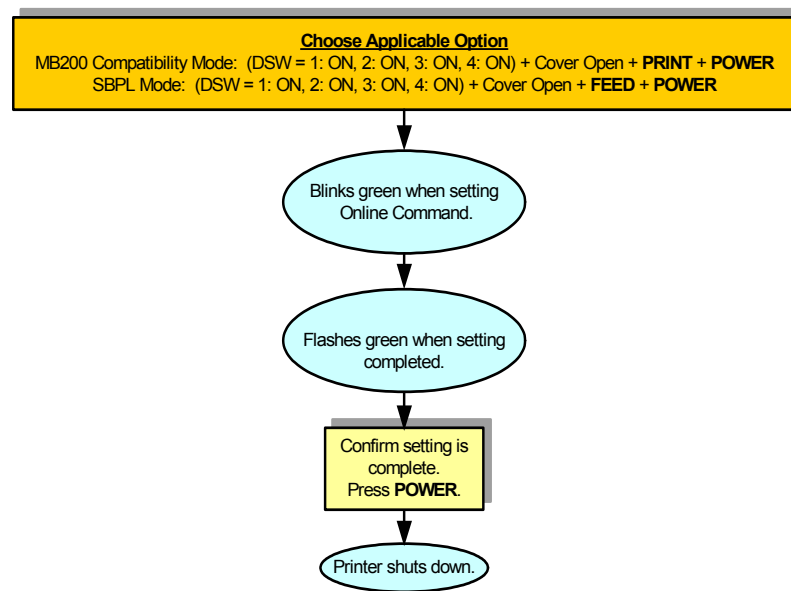


Figure 5-6, Online Command Mode

CRC (CYCLIC REDUNDANCY CHECK) MODE

Allows the operator to enable or disable the Cyclic Redundancy Check (CRC) for each received print data when using wireless LAN or Bluetooth interface.

Refer to Figure 1-1 of the Introduction unit in this manual for dipswitch location.

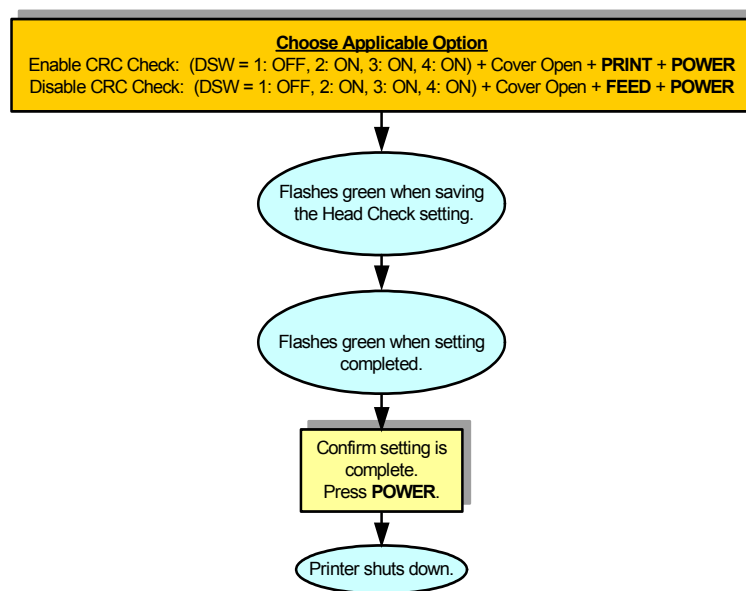


Figure 5-7, CRC Check Mode

SLEEP & AUTO-OFF MODE

This mode is a non-interactive mode that is provided to explain the timed sequence of events that relate to the printer going into sleep mode and then further into offline mode.

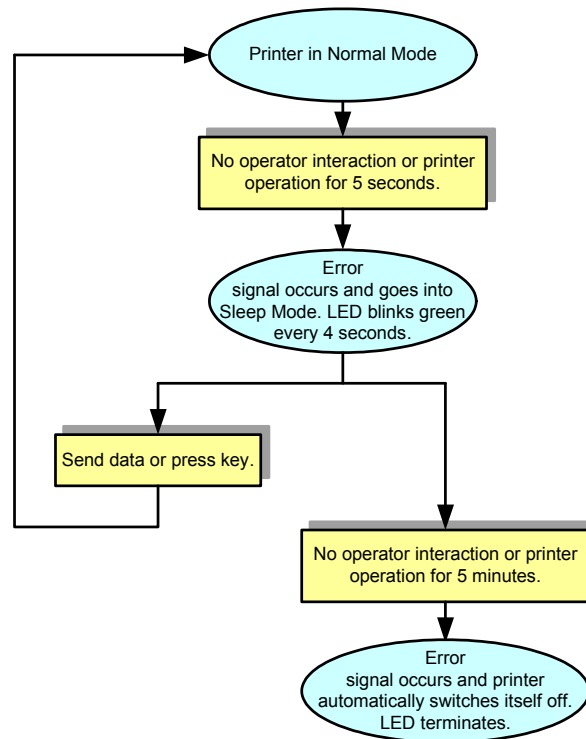


Figure 5-8, Sleep & Auto-Off Mode

6

TROUBLESHOOTING

- **Error Signals**
- **Troubleshooting Table**
- **Interface Troubleshooting**
- **Test Print Troubleshooting**

ERROR SIGNALS		
LED	MODE	DESCRIPTION
Red illuminated	All modes	Cause: Low battery charge. Remedy: Recharge/ replace battery.
Red flashing 2.0 seconds	Online	Cause(s): Bluetooth or Wireless LAN malfunction. Remedy: Replace the interface module.
Red illuminated	After power On	Cause(s): 1. Program error. 2. Flash ROM error. Remedy: 1. Download program again. 2. Replace Flash ROM.
Alternating Green/Red 2.0 seconds	Online	Cause(s): Defective print head.
		Remedy: Replace print head.
Red flashing 0.5 seconds	Online	Cause(s): 1. Cover is not latched or sensor is defective. 2. Paper End sensor incorrectly set. 3. Incorrect media sensor selection or adjustment. Remedy: 1. Latch cover or replace print head. 2. Properly set Paper End sensor. 3. Select correct sensor & adjust. Replace board as required.
Green flashing 0.5 seconds	Online (during printing & data receiving)	Cause(s): Size of received data exceeds size of receiving buffer. Remedy: Temporarily stop sending data until space is free.
Green flashing 4.0 seconds	All Modes	Cause(s): Is in Sleep Mode. Not an error. Remedy: Will cease when data is received, a key pressed, or cover opened.
Alternating Green/Red 1.0 seconds	All Modes	Cause(s): Print head is hotter than 70 degrees celsius. Remedy: Cease printing until the print head has cooled to 50 degrees celsius or less.

TROUBLESHOOTING TABLE	
IMAGE VOIDS	
Damaged print head or electronics.	Replace as required.
Damaged or worn platen roller.	Replace platen roller.
Vertical line in printed image.	Dirty or defective print head.
LIGHT PRINT IMAGES	
Low print head energy/darkness.	Adjust darkness control.
Foreign material on print head.	Clean print head and platen roller.
Excessive print speed.	Reduce print speed setting.
UNEVEN PRINT DARKNESS	
Worn platen roller.	Replace platen roller as required.
Dirty print head.	Clean as necessary.
SMEARED PRINT IMAGES	
Poor label quality.	Use higher quality label stock.
Debris on print head & platen roller.	Clean print head and platen roller.
NO LABEL MOVEMENT	
Incorrect label pitch sensor selected.	Select the correct label sensor type.
No voltage output.	Test power supply or battery and replace as required.
Drive motor not operating.	Ensure wiring harness connection.
Defective main board.	Contact SATO Service or Technical Support.
NO PRINTED IMAGE	
No voltage output.	Test power supply or battery and replace as necessary.
Damaged print head.	Replace as required.
Interface problems.	Check interface connection.
Data input error.	Ensure correct data stream.
MEANDERING MEDIA	
Incorrectly loaded media.	Ensure correct loading.
Improperly adjusted media guides.	Adjust as required.
PRINTER CREATES A BLANK LABEL	
Data input error.	Ensure correct data stream.
Improper top of form selected.	Ensure correct top of form is in use (Gap, Blackban).
Defective print head.	Replace print head as required.

INTERFACE TROUBLESHOOTING

RS232 SERIAL INTERFACE	
CHK	TROUBLESHOOTING STEP
	Ensure the correct interface module is correctly installed. Run self-test to verify.
	Ensure the serial cable (Null Modem) meets specifications and is correctly connected at each end.
	Ensure the serial cable is not defective.
	Ensure the communication parameters for the baud rate, parity, data bits and stop bits are consistent with those being sent from the host computer.
	Ensure the printer is receiving information from the computer using the Receive Buffer Hex Dump mode. Refer to that procedure within this manual for instructions. The command stream should be continuous and possess 0Dhex and/or 0Ahex (carriage return and line feed) characters throughout. However, there should not be either locate between the start (<ESC>A and the stop (<ESC>Z) commands.
	Replace the interface board with another to isolate the problem.
	Replace the interface board permanently if determined to be the problem.

WIRELESS ETHERNET INTERFACE	
CHK	TROUBLESHOOTING STEP
	Ensure the printer is the Wireless LAN model that comes equipped with an LCD screen.
	Ensure the printer's dipswitches are set to OFF, ON, OFF, OFF.
	Ensure the configuration setting for the device is correct. Ensure the network is correctly configured for the MB200i/MB201i printer. This may be verified by performing a test print to view the current settings. Ensure the IP address, subnet mask, gateway and security settings are synchronized to match the system network's settings (your network administrator can verify). Alternately, check the settings via the printer's LCD by invoking its Maintenance Mode.
	Ensure the access point communication link is correct. Perform a communications test to determine if the access point is responding. Start a command prompt window on a Windows PC through a wired network and ping the wireless access point's IP address - the wireless access point should respond to the ping. If not, there is either a break in the communication link or the access point is malfunctioning or improperly configured.
	Ensure the Wireless communication link is correct. Then execute the Command prompt on a PC and ping the printer - the device should respond to the ping. If not, there is either a break in the communications link or the printer was not properly configured. Check the printer's settings again.
	Attempt to ping the printer again from a wired/wireless client. If the ping still fails, the unit is probably malfunctioning and should be replaced. Contact SATO technical staff for assistance.

TEST PRINT TROUBLESHOOTING

Chapter provides instruction on special printing to identify and resolve specific print problems.

HEX DUMP	Allows the operator to determine if there were problems in the downloading of data.
TEST LABEL	Allows the operator to identify specific problems regarding mechanical performance and setup.

HEX DUMP MODE

The contents of the print buffer can be examined using the Hex Dump Mode. In the left column, each line of data received is numbered. The center column provides the data in hexadecimal format. And in the right column, same data is provided in the ASC II format. Follow the flow chart provided below to perform this activity.

Refer to Figure 1-1 of the Introduction unit in this manual for dipswitch location.

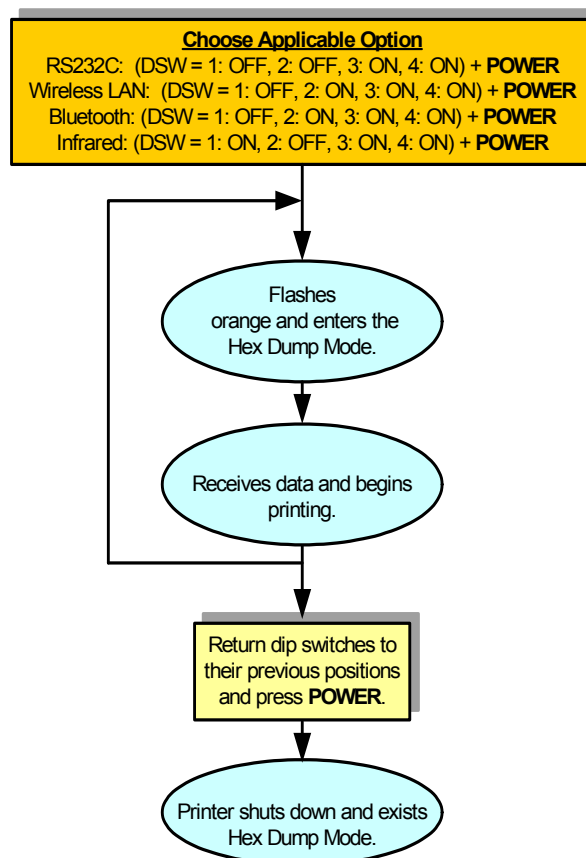


Figure 6-1, Hex Dump Mode

TEST LABEL PRINTING

The test label is designed to assist in the identification of print problems. Follow the flow chart provided below to perform this activity.

Refer to Figure 1-1 of the Introduction unit in this manual for dipswitch location.

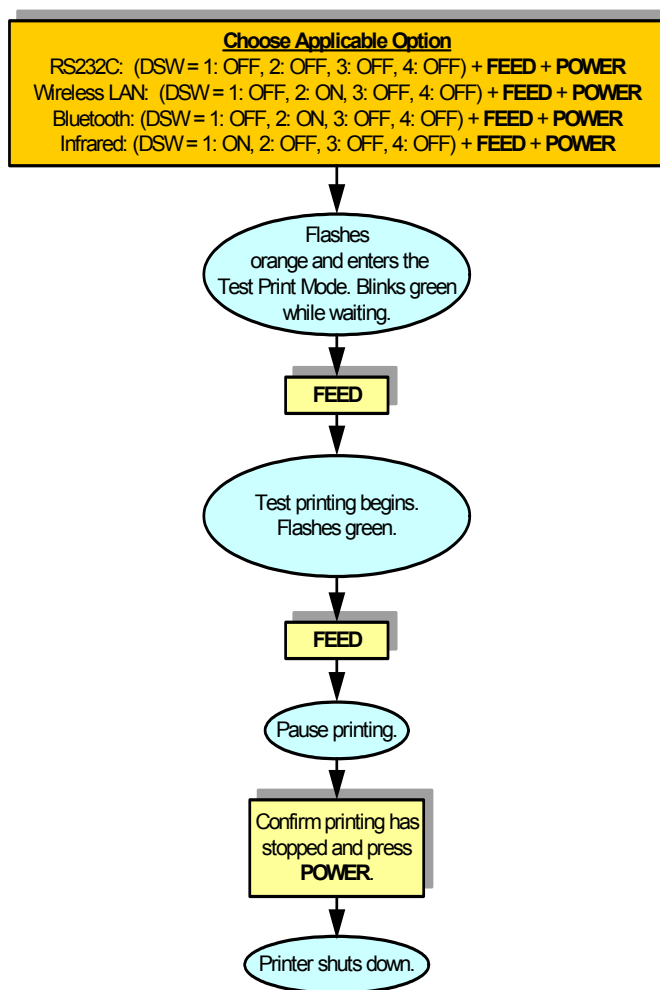


Figure 6-2, Test Print Mode

7

REPLACEMENT PROCEDURES

- **Print Head**
- **Dispense Bar**
- **Platen Roller**
- **Paper Roller**
- **Main Circuit Board (A)**
- **Main Circuit Board (B)**
- **Panel Board**
- **Eye-Mark Sensor**
- **Gap Sensor**
- **Head Open Sensor**
- **Drive Motor**
- **Drive Gear**

REPLACEMENT PROCEDURES

This unit contains step-by-step instructions for the removal and replacement of all primary components and sub-assemblies.

PRINT HEAD REPLACEMENT

If the print head becomes damaged or worn, it can be easily removed and replaced without having to make critical adjustments.

- 1 Switch off the printer and remove power supply or battery.
- 2 Perform a Factory Test Print and check the head counter.
- 3 Open the top housing cover to access the print head (Figure 7-1a).
- 4 Insert a flat driver into the slots of the sensor guide and pry upward. Lift away sensor guide.
- 5 Insert a flat driver between the print head bracket and the sensor bracket and pry free.
- 6 Lift away defective print head and disconnect its wiring harness.

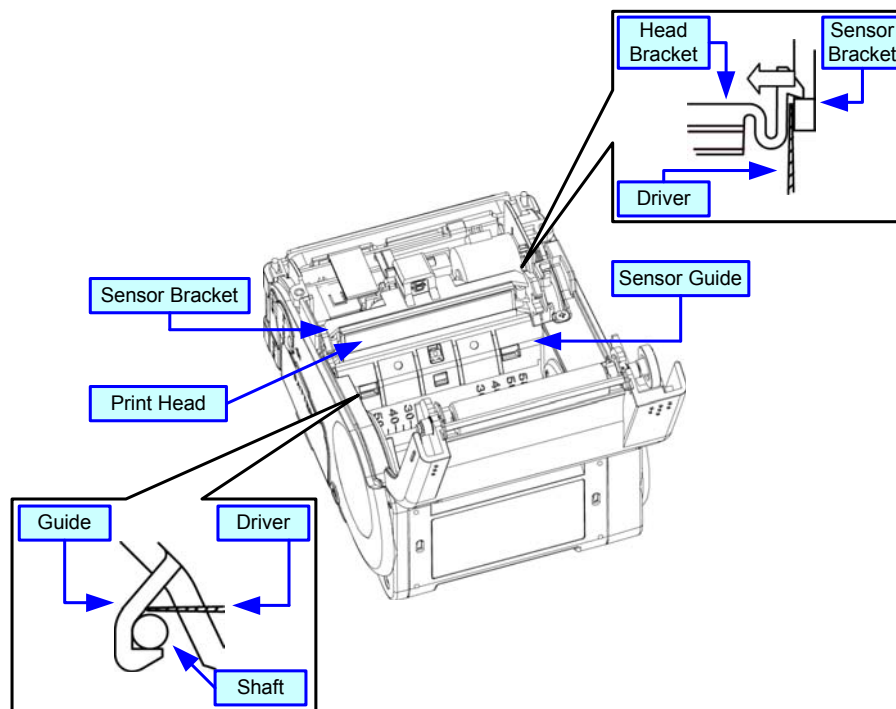


Figure 7-1a, Print Head Replacement

- 7 Connect the print head wiring harness to the replacement print head.
- 8 Insert replacement print head into the print assembly and press into position.
- 9 Insert sensor bracket into the print assembly and press into position.
- 10 Reset the head counter in accordance with the procedures enclosed.
- 11 Restore power and test print.

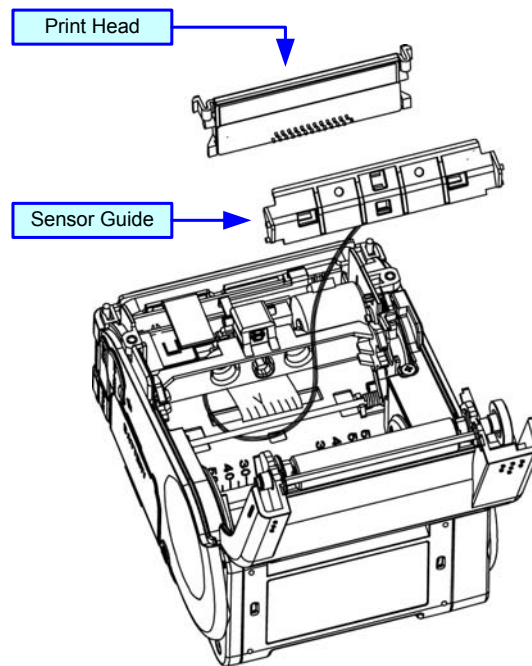


Figure 7-1b, Print Head Replacement

DISPENSE BAR REPLACEMENT

- 1 Switch off the printer and remove power supply or battery.
- 2 Open the top housing cover to gain better access to the dispense bar.
- 3 Insert a flat driver between a dispense bracket and the top housing cover (Figure 7-2a).

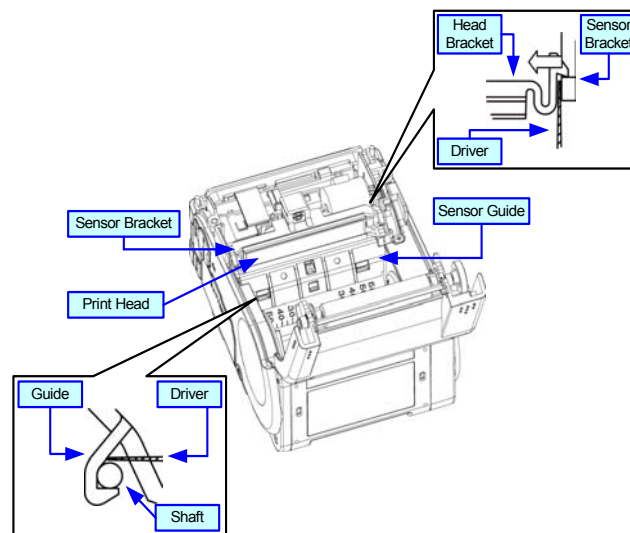


Figure 7-2a, Dispense Bar Replacement

- 4 Rotate the dispense bracket forward while prying the bracket away from the housing cover.
- 5 Repeat step 4 for the opposite end of the bracket and lift free the assembly (Figure 7-2b).

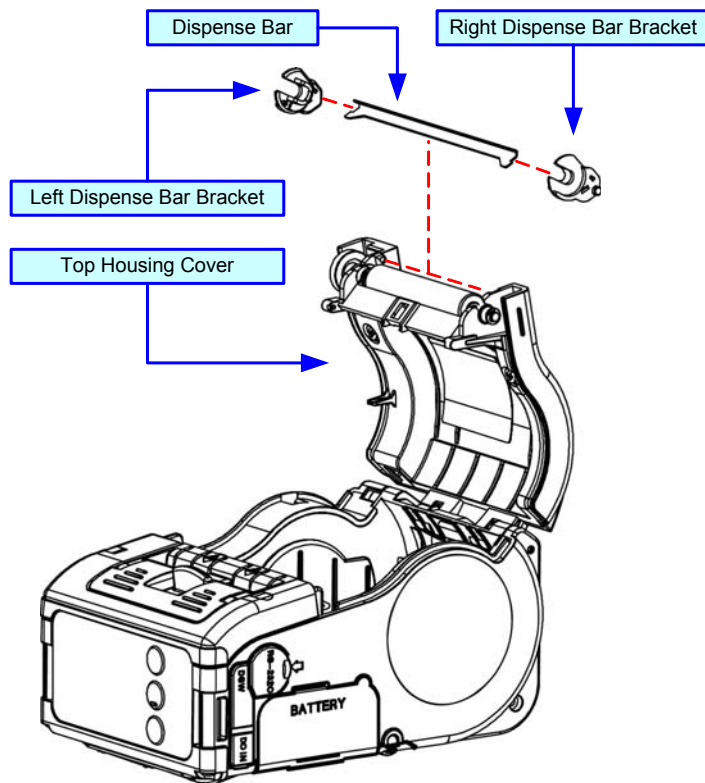


Figure 7-2b, Dispense Bar Replacement

- 6 Assemble the replacement dispense bar in the orientation as the original prior to removal (Figure 7-2c).

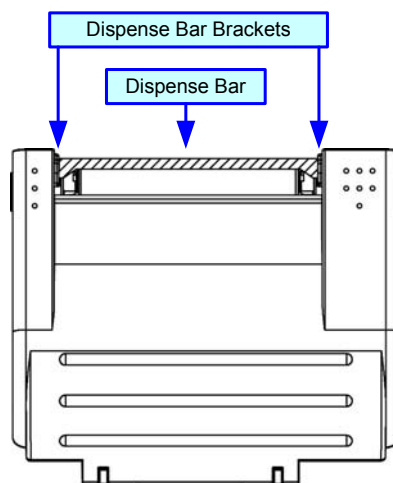


Figure 7-2c, Dispense Bar Replacement

PLATEN ROLLER REPLACEMENT

The platen roller is a high wear component due to its treading against the print media. This treading will eventually wear grooves into the rubber material and negatively effect print output.

- 1 Switch off the printer and remove power supply or battery.
- 2 Open the top housing cover to access the platen roller.
- 3 Remove the dispense bar in accordance with its relative replacement procedure.
- 4 Move the bearings on each end of the platen roller inward from within the platen roller bracket (Figure 7-3a).

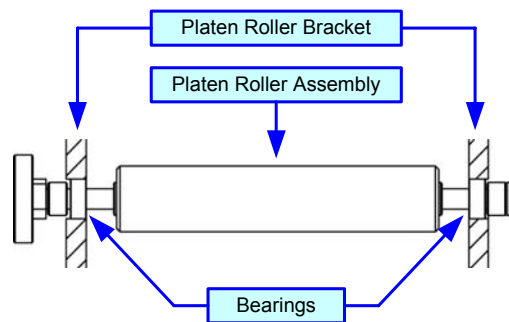


Figure 7-3a, Platen Roller Replacement

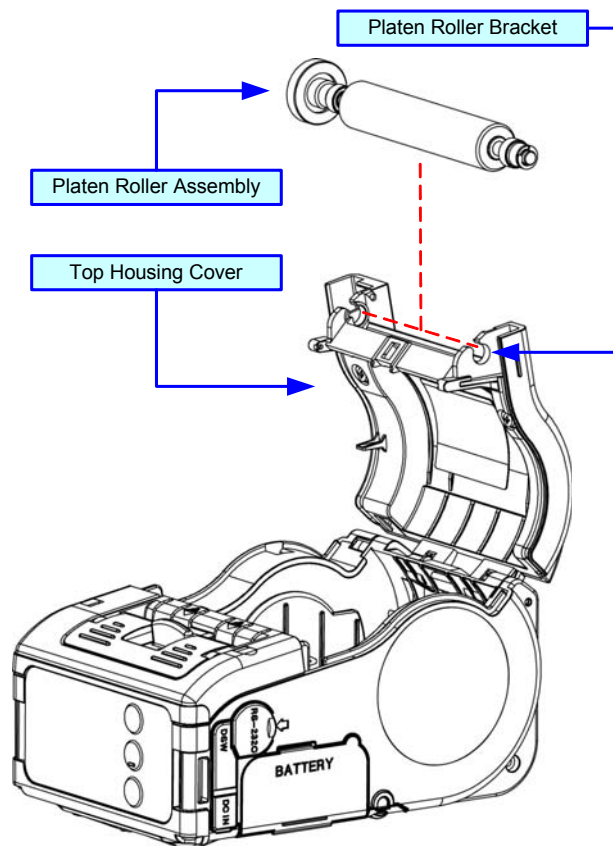


Figure 7-3b, Platen Roller Replacement

- 5 Lift the worn platen roller assembly from the platen roller bracket and discard (Figure 7-3b).
- 6 Insert the replacement platen roller assembly into the platen roller bracket oriented as the original prior to removal.
- 7 Move the bearings on each end of the platen roller assembly outward to nest in the platen roller bracket.
- 8 Install the dispense bar in accordance with its relative replacement procedure.

DISPENSER ROLLER

- 1 Switch off the printer and remove power supply.
- 2 Remove the top cover from the printer to remove the dispenser assembly (Figure 7-4).
- 3 Detach the dispenser assembly and open lever from the top cover.
- 4 Detach the snap ring from the dispense roller shaft and remove the assembly from the dispenser.
- 5 Withdraw the worn roller from the shaft and insert the replacement roller in its place.
- 6 Insert the roller assembly into the dispenser assembly and secure using the snap ring.
- 7 Reattach the dispenser assembly and open lever to the top cover.
- 8 Secure top cover to the printer and test print a label.

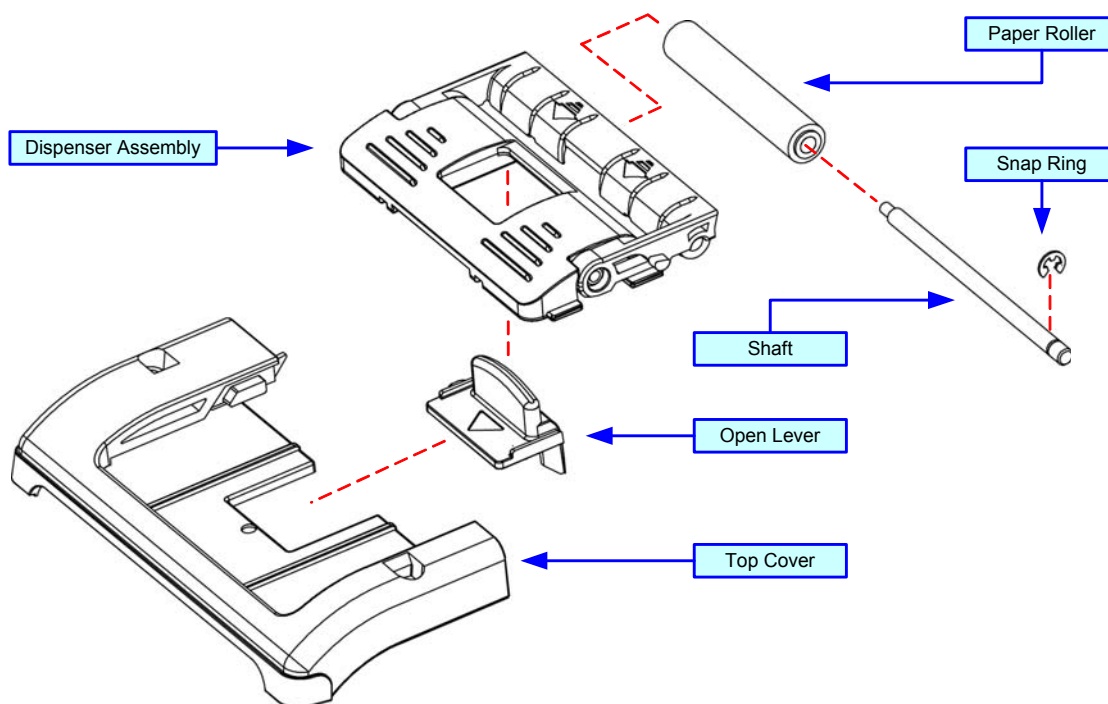


Figure 7-4, Dispense Roller Replacement

MAIN CIRCUIT BOARD (A) REPLACEMENT

- 1 Switch off the printer and remove power supply.
- 2 Remove the front, top, left, and right housing covers.

NOTE: Figure 9-1 of the Charts & Diagrams unit provides guidance on housing cover removal.

- 3 Remove the two screws securing main circuit board (A) to the printer chassis (Figure 7-5).
- 4 Withdraw the defective main circuit board and disconnect all wiring harnesses.
- 5 Attach all relative wiring harnesses to the replacement circuit board.
- 6 Insert the replacement circuit board into the printer chassis and secure using the two screws.
- 7 Replace all housing covers, restore power, and test print.

NOTE: Figure 9-1 of the Charts & Diagrams unit provides guidance on housing cover installation.

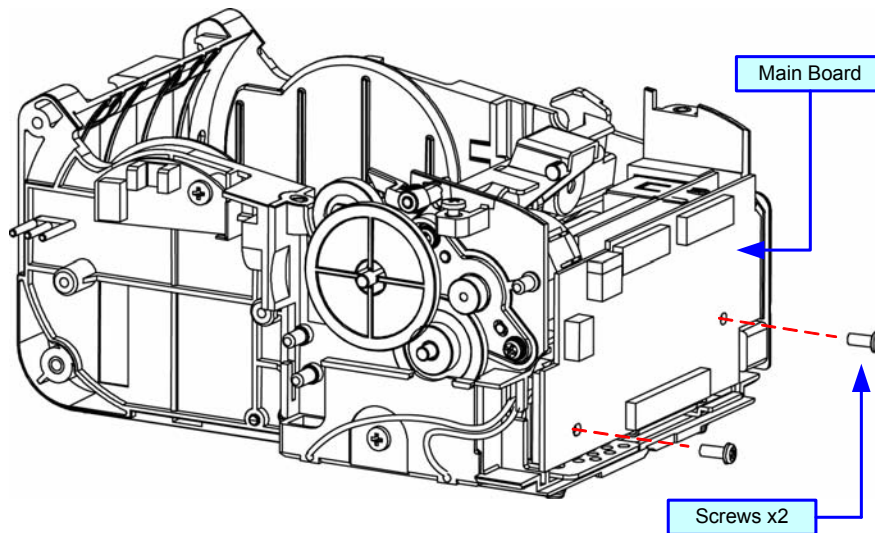


Figure 7-5, Main Circuit Board (A) Replacement

MAIN CIRCUIT BOARD (B) REPLACEMENT

- 1 Perform steps 1 through 4 of the Main Circuit Board (A) Replacement procedure.
- 2 Withdraw the two spacers and defective main circuit board (B) from the printer chassis (Figure 7-6).
- 3 Connect all relative wiring harnesses to the replacement circuit board (B).
- 4 Install the replacement circuit board (B) onto the printer chassis followed by the two spacers.
- 5 Connect all relative wiring harnesses to main circuit board (A).
- 6 Apply main circuit board (A) to the assembly and secure using the two screws.
- 7 Replace all housing covers, restore power, and test print.

NOTE: Figure 9-1 of the Charts & Diagrams unit provides guidance on housing cover installation.

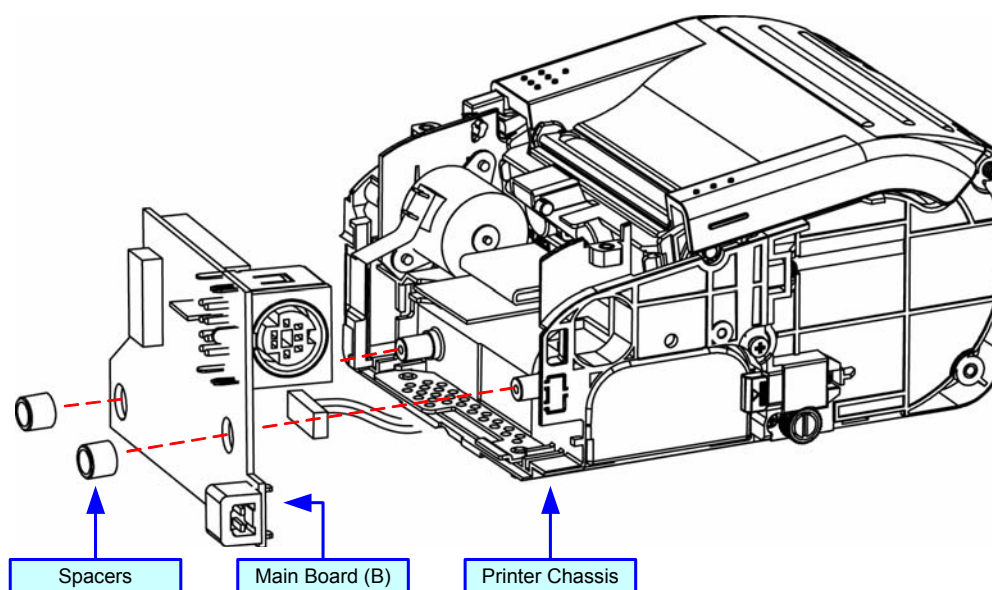


Figure 7-6, Main Circuit Board (B) Replacement

PANEL & LCD BOARD REPLACEMENT

- 1 Switch off the printer and remove power supply or battery.
- 2 Remove the front housing cover (Figure 7-7).

NOTE: Figure 9-1 of the Charts & Diagrams unit provides guidance on housing cover removal.

- 3 Remove the screw securing the panel board to the back side of the front housing cover.
- 4 Disconnect all relative wiring harnesses and discard the defective board.
- 5 Connect all relative wiring harnesses to the replacement panel board and secure using one screw.
- 6 Install front housing cover to the printer chassis.

NOTE: Figure 9-1 of the Charts & Diagrams unit provides guidance on housing cover installation.

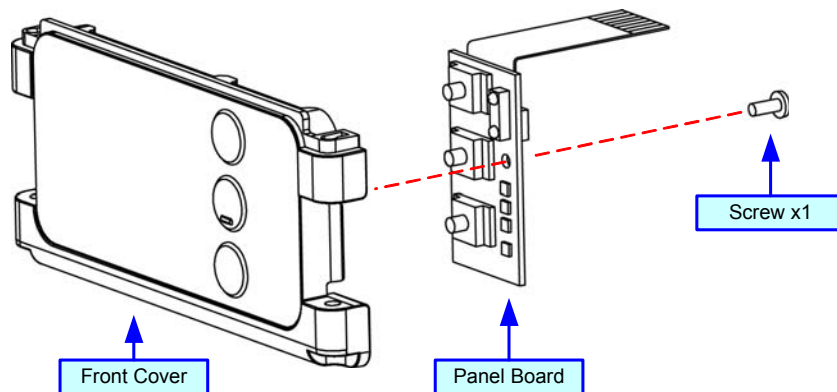


Figure 7-7, Panel & LCD Board Replacement

EYE-MARK SENSOR REPLACEMENT

- 1 Switch off the printer and remove power supply.
- 2 Remove the front and left housing covers

NOTE: Figure 9-1 of the Charts & Diagrams unit provides guidance on housing cover removal.

- 3 Remove two screws securing the inner cover to the top housing cover (Figure 7-8a).

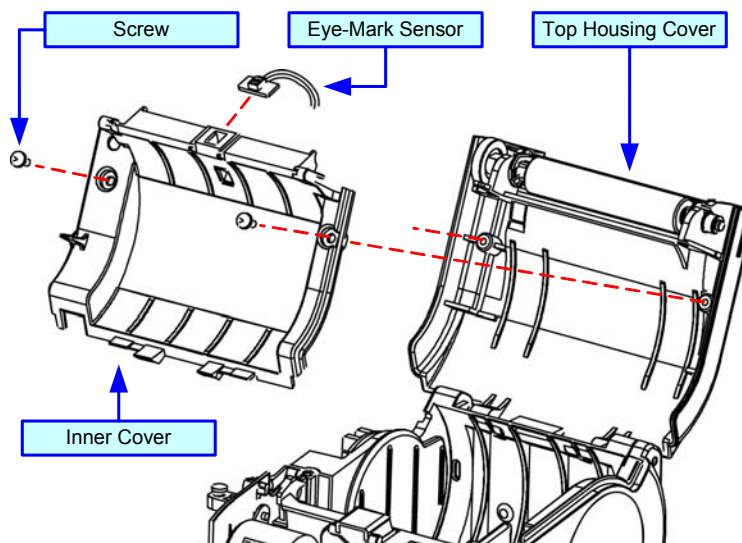


Figure 7-8a, Eye-Mark Sensor Replacement

- 4 Detach the eye-mark sensor from the inner cover.
- 5 Disconnect the defective eye-mark sensor from the circuit board located on the left side of the printer (Figure 7-8b).

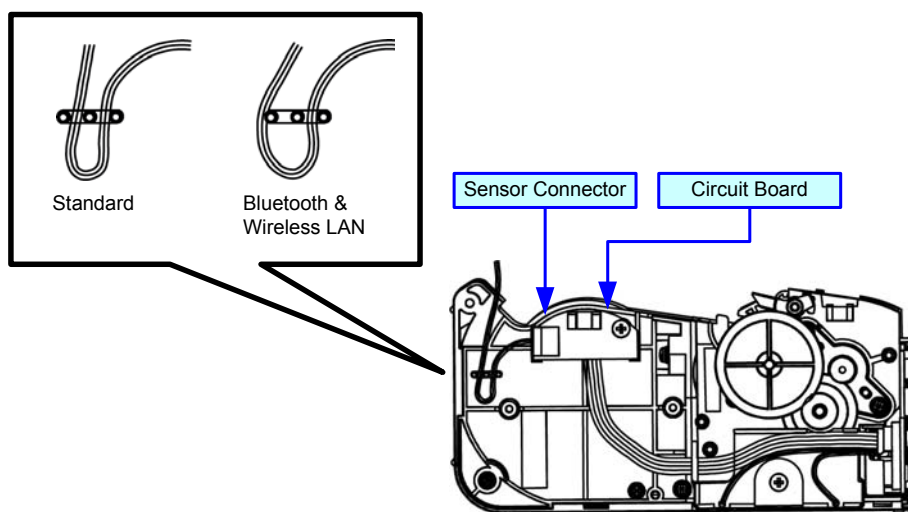


Figure 7-8b, Eye-Mark Sensor Replacement

- 6 Insert the replacement eye-mark sensor to the inner cover and route the sensor harness (Figure 7-8c).

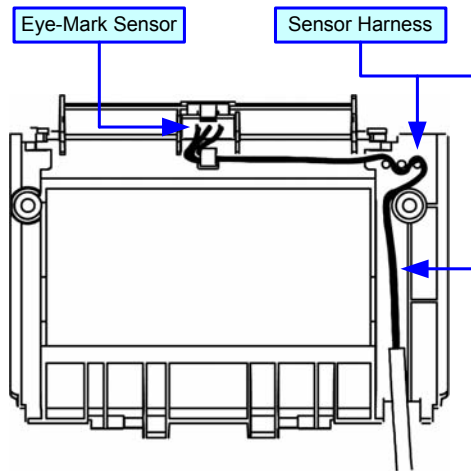


Figure 7-8c, Eye-Mark Sensor Replacement

- 7 Secure the inner cover to the top housing cover using the two screws (Figure 7-8a).
- 8 Connect the sensor to the circuit board and route the wiring harness (Figure 7-8b).
- 9 Ensure the wiring harness has sufficient slack (Figure 7-8d).

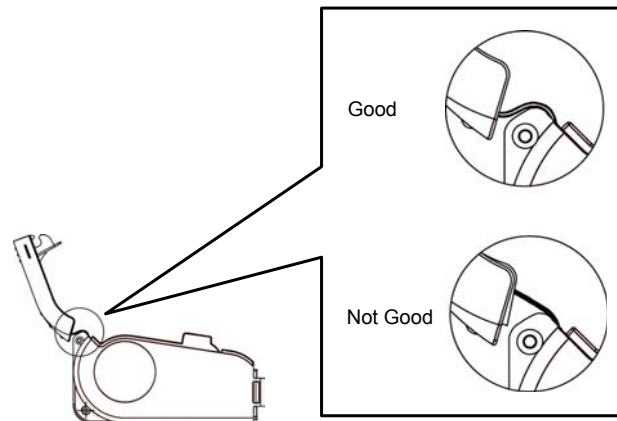


Figure 7-8d, Eye-Mark Sensor Replacement

- 10 Reattach the top, left, and front housing covers.

NOTE: Figure 9-1 of the Charts & Diagrams unit provides guidance on housing cover installation.

GAP SENSOR REPLACEMENT

- 1 Switch off the printer and remove power supply.
- 2 Remove the front housing cover.

NOTE: Figure 9-1 of the Charts & Diagrams unit provides guidance on housing cover removal.

- 3 Open the top housing cover to access the gap sensor (Figure 7-9a).

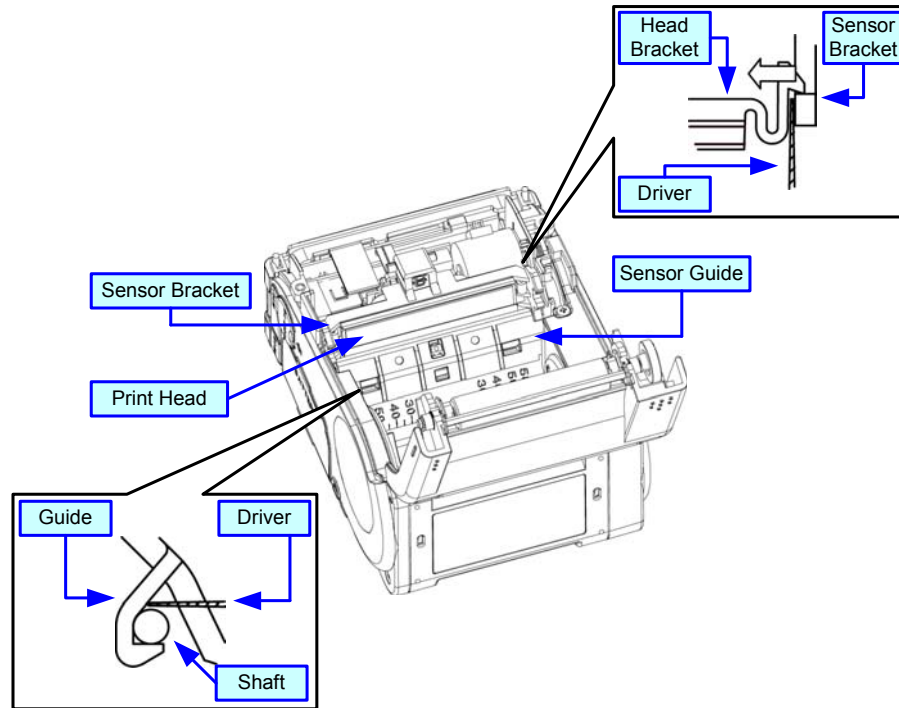


Figure 7-9a, Gap Sensor Replacement

- 4 Insert a flat driver into the slots of the sensor guide and pry upward to remove.
- 5 Insert a flat driver between the print head bracket and the sensor bracket and pry outward to detach.
- 6 Perform step 4 for each end of the print head until it is removed (Figure 7-9b).
- 7 Disconnect the defective sensor from the main circuit board and detach from the sensor bracket.
- 8 Connect the replacement sensor to the main circuit board, the sensor bracket, and the sensor guide.
- 9 Reapply the print head and the sensor guide to the printer chassis.
- 10 Install all removed housing covers and test print.

NOTE: Figure 9-1 of the Charts & Diagrams unit provides guidance on housing cover installation.

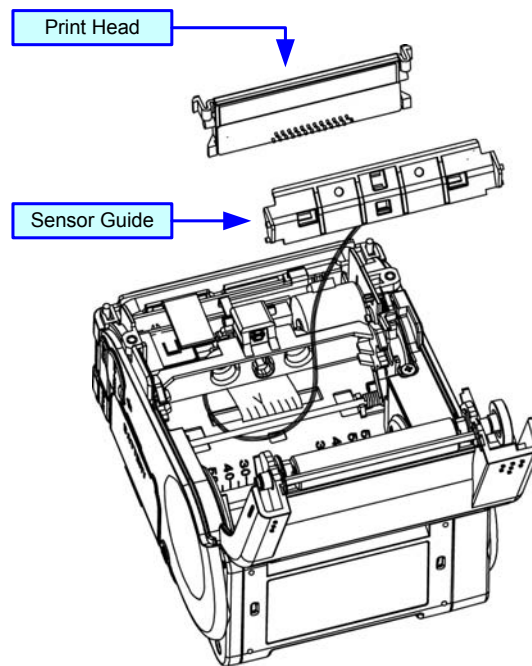


Figure 7-9b, Gap Sensor Replacement

COVER-OPEN SENSOR REPLACEMENT

- 1 Switch off the printer and remove power supply.
- 2 Remove the front and left housing covers to gain access to the cover-open sensor.

NOTE: Figure 9-1 of the Charts & Diagrams unit provides guidance on housing cover removal.

- 3 Disconnect the eye-mark sensor from cover-open sensor board (Figure 7-10a).

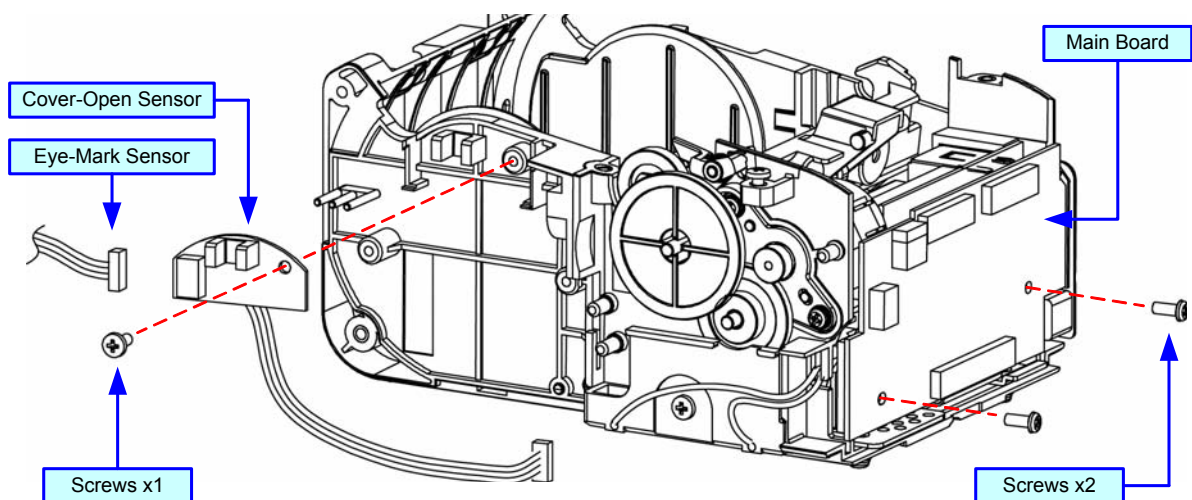


Figure 7-10, Cover-Open Sensor Replacement

- 4 Remove one screw securing the defective sensor to the printer chassis.
- 5 Remove two screws securing the main circuit board to the printer chassis.
- 6 Withdraw the main circuit board from the printer chassis and disconnect the defective cover-open sensor.
- 7 Connect the replacement cover-open sensor to the circuit board.
- 8 Secure the main circuit board to the printer chassis using two screws.
- 9 Route the sensor wiring harness (Figure 7-10b).

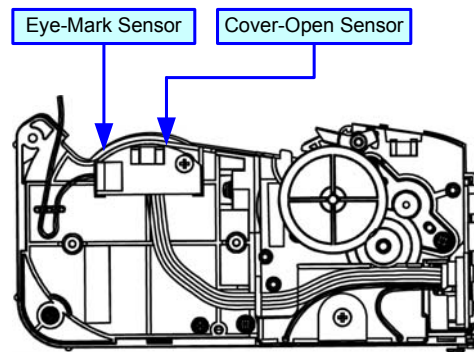


Figure 7-10b, Cover-Open Sensor Replacement

- 10 Attach the sensor to the printer chassis using one screw.
- 11 Reconnect the eye-mark sensor to the cover-open sensor circuit board.
- 12 Install all removed housing covers.

NOTE: Figure 9-1 of the Charts & Diagrams unit provides guidance on housing cover installation.

DRIVE GEAR REPLACEMENT

- 1 Switch off the printer and remove power supply.
- 2 Remove the front and left housing covers.

NOTE: Figure 9-1 of the Charts & Diagrams unit provides guidance on housing cover removal.

- 3 Withdraw worn gears (A) and (B) from the printer chassis.
- 4 Insert replacement gears (B) and (A) into their respective positions identified by the numeral 2.
- 5 Install all removed housing covers.

NOTE: Figure 9-1 of the Charts & Diagrams unit provides guidance on housing cover installation.

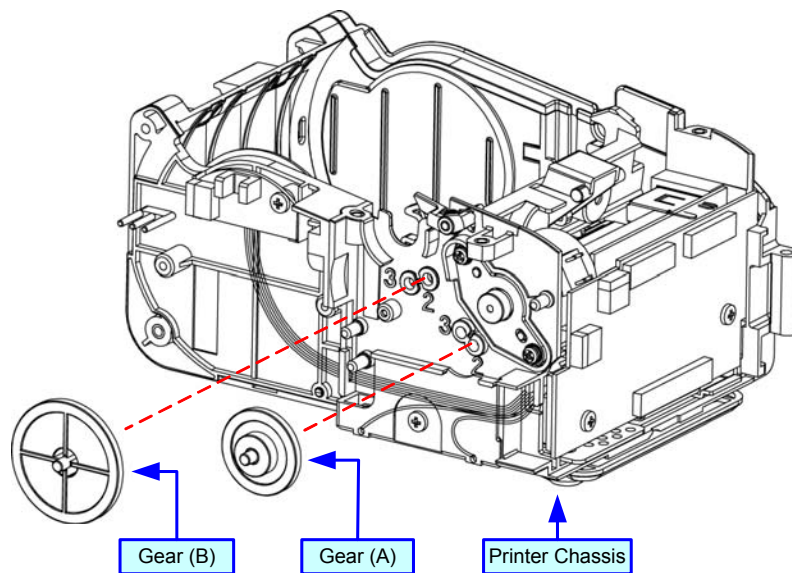


Figure 7-11, Gear Replacement

DRIVE MOTOR REPLACEMENT

- 1 Switch off the printer and remove power supply or battery.
- 2 Remove the front and left housing covers.

NOTE: Figure 9-1 of the Charts & Diagrams unit provides guidance on housing cover removal.

- 3 Withdraw gears (A) and (B) from the printer chassis (Figure 7-12).
- 4 Remove the two screws securing the motor bracket and motor to the printer chassis.
- 5 Disconnect defective motor and discard. Connect the replacement motor.
- 6 Secure the replacement motor to the printer chassis using motor bracket and two screws.
- 7 Insert gears (B) and (A) into their respective positions identified by the numeral 2.
- 8 Install all removed housing covers.

NOTE: Figure 9-1 of the Charts & Diagrams unit provides guidance on housing cover installation.

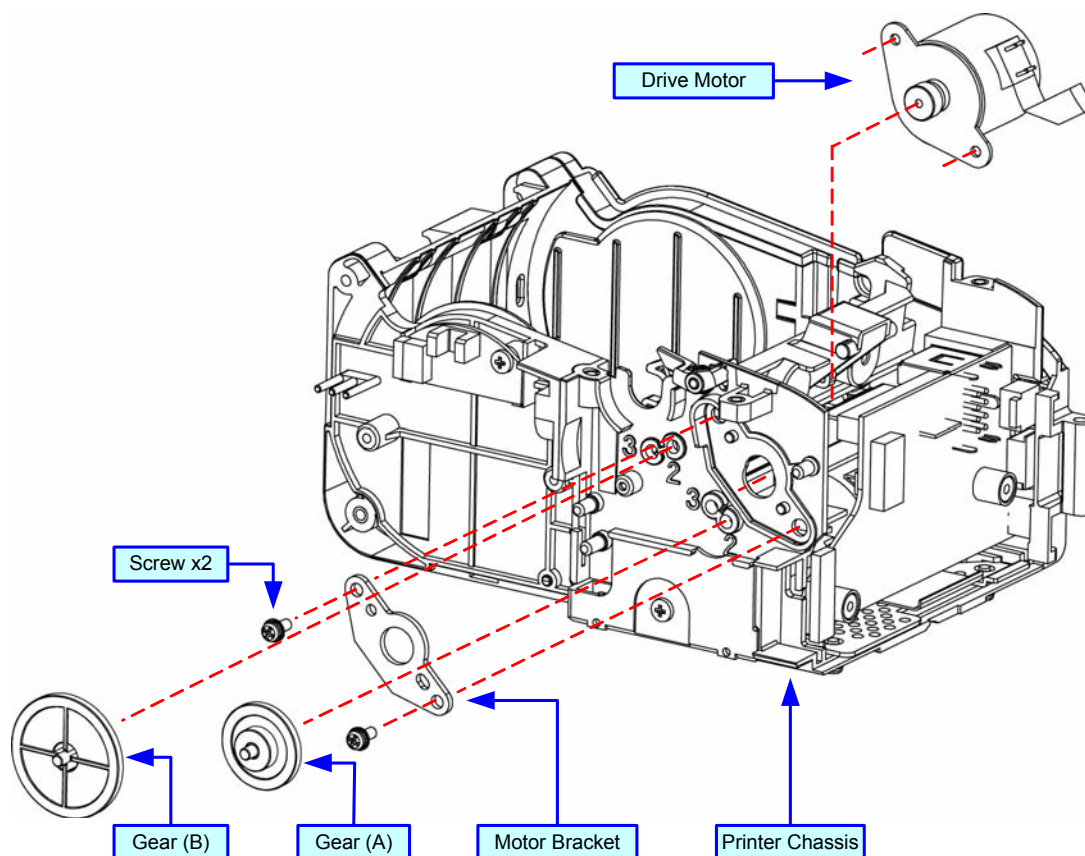


Figure 7-12, Drive Motor Replacement

8

ADJUSTMENT PROCEDURES

- **Pitch Adjustment**
- **Print Darkness**
- **Default Setting Mode**
- **Factory Clear Mode**

ADJUSTMENT PROCEDURES

This unit covers all of the printer adjustment procedures that may occur following the initial configuration. Due to its simple maintenance-free design, there are few adjustments that will be required.

PITCH ADJUSTMENT

The pitch setting determines the print position on the label in relation to the eye-mark reference. The eye-mark sends a signal indicating the end of the prior label and the pitch adjustment is based on the linear distance of feed from the time the signal was transmitted.

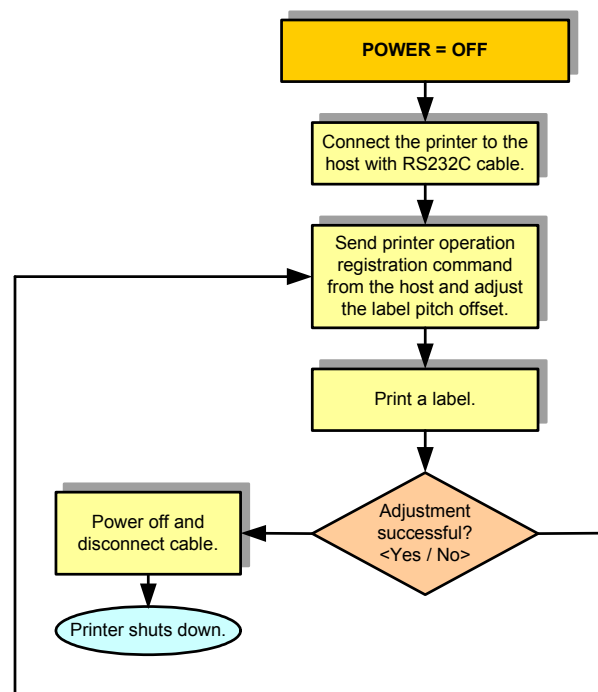


Figure 8-1, Pitch Adjustment

PRINT DARKNESS

This feature allows the print density sharpness to be adjusted. This adjustment must be made through a host to printer interface connection.

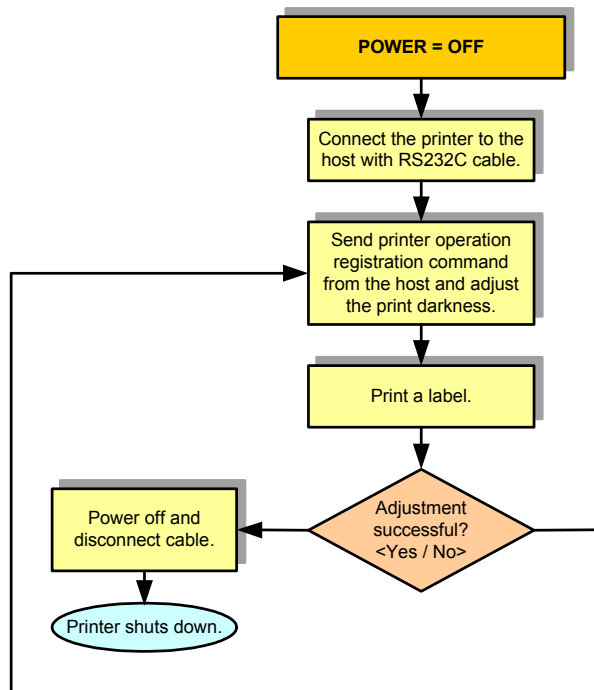


Figure 8-2, Print Darkness

DEFAULT SETTING MODE

The Default Settings Mode allows the printer to be returned to factory defaults. This process does not however, affect the printer's internal counters. Host to printer interface connection is required.

The figure below provides the specific sequence of events required by the operator and the printer.

Refer to Figure 1-1 of the Introduction unit in this manual for dipswitch location.

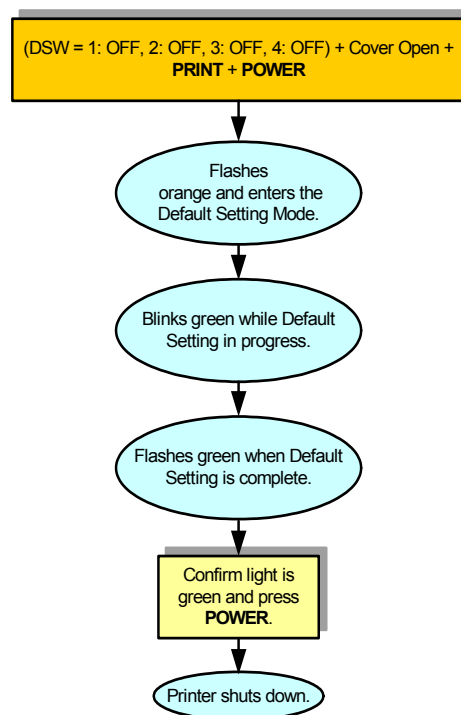


Figure 8-3, Default Setting Mode

FACTORY CLEAR MODE

Factory clear is the process of reinitializing the printer. This process returns the printer to the factory defaults and includes resetting the printer's internal counters. The figure below details dipswitch settings, operator actions, and printer responses for Factory Clear Mode.

Refer to Figure 1-1 of the Introduction unit in this manual for dipswitch location.

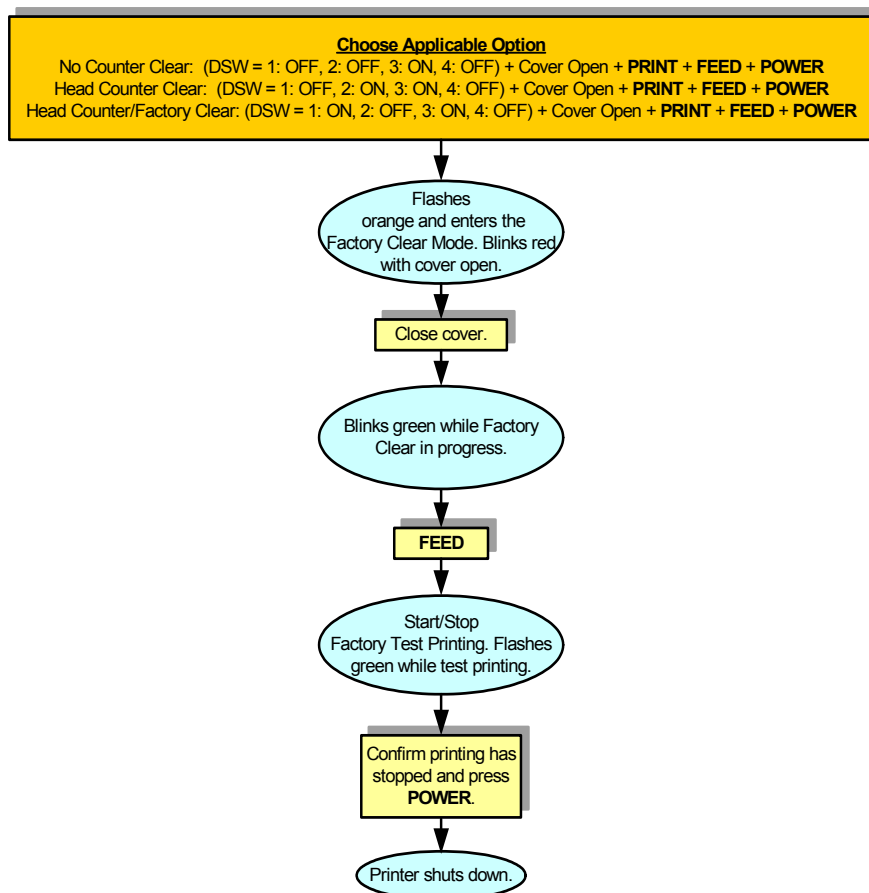


Figure 8-4, Factory Clear Mode

9

CHARTS & DIAGRAMS

- **Cover Removal Diagram**

COVER REMOVAL DIAGRAM

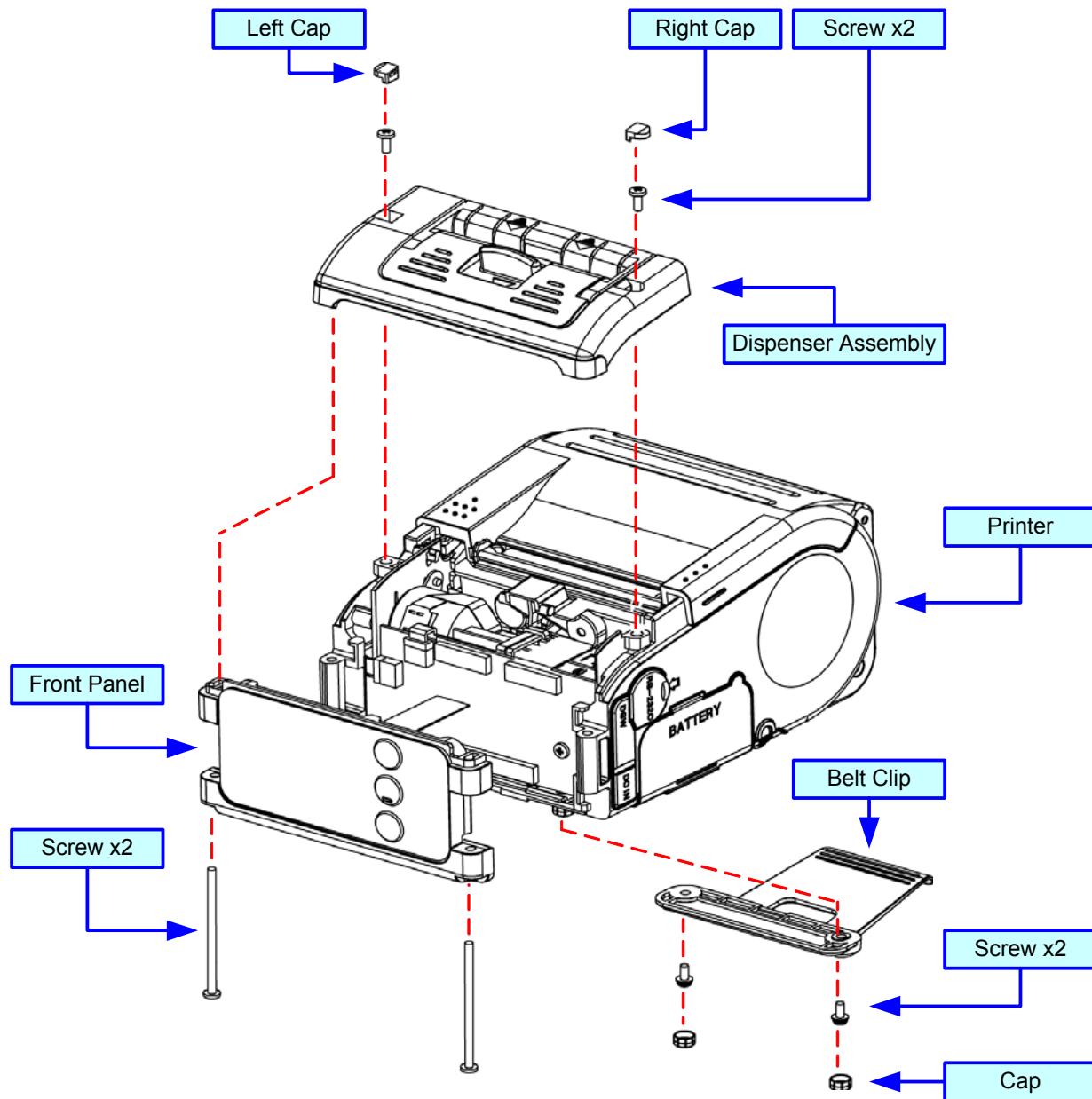


Figure 9-1a, Cover Removal Diagram

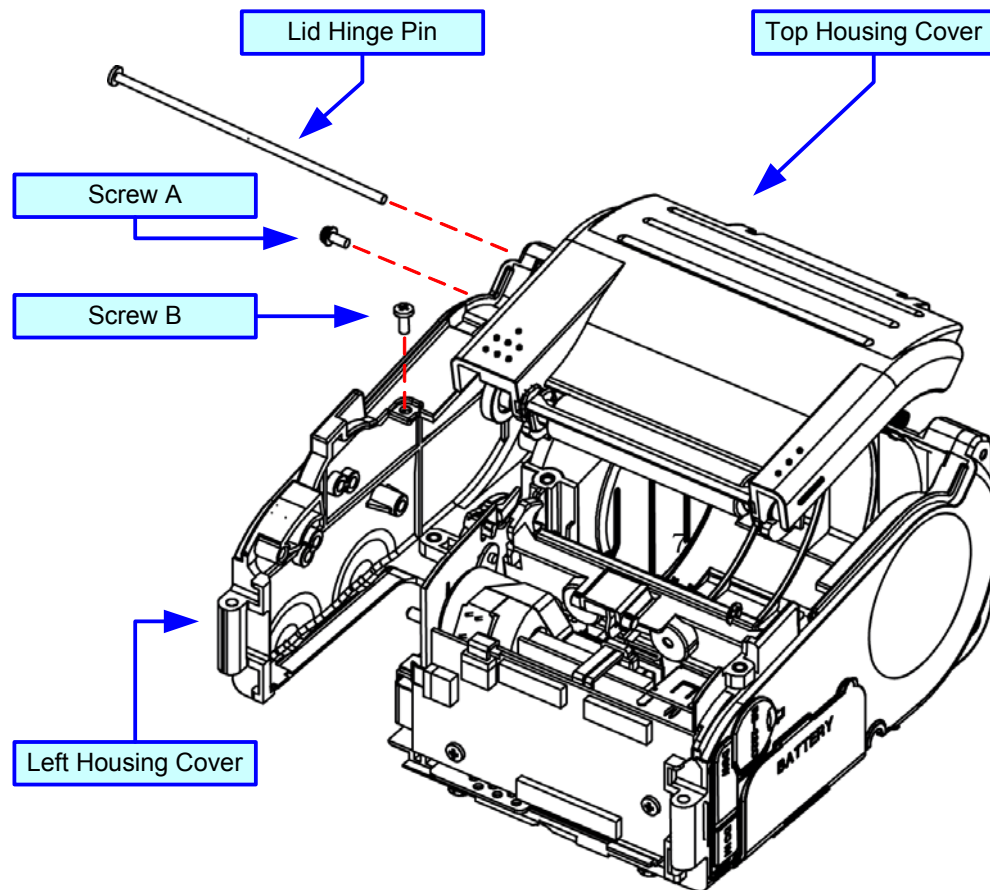


Figure 9-1b, Housing Cover Removal

