DCS & Labeling Worldwide

GL4xxe Series

OPERATOR'S MANUAL

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Be sure to ask your dealer about our maintenance contracts
to ensure peace of mind during your usage of SATO products

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Warning: This equipment complies with the requirements in Part 15 of FCC rules for a Class A computing device. Operation of this equipment in a residential area may cause unacceptable interference to radio and TV reception requiring the operator to take whatever steps are necessary to correct the interference.

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OVERVIEW

Thank you for your investment in this SATO printer product.

This Operator's Manual contains basic information about the installation, setup, configuration, operation and maintenance of the printer.

A total of seven topics are covered herein, and they are organized as follows:

Section 1: Overview
Section 2: Installation
Section 3: Configuration and Operation
Section 4: Cleaning and Maintenance
Section 5: Troubleshooting
Section 6: Optional Accessories

It is recommended that you become familiar with each section before installing and maintaining the printer. Refer to the **Table Of Contents** at the front of this manual to search for the relevant information needed. All page numbers in this manual consist of a section number followed by the page number within the stated section.

For specialized programming, refer to the separate Programming Manual located on the utility CD-ROM.

1.1 GENERAL SPECIFICATIONS

The SATO GL4XX "*e*" series of dual use (Thermal Transfer and Direct Thermal) printers are complete, high-performance labeling systems designed for printing tags and labels.

The key features of the GL series are:

- Availability in 203 dpi or 305 dpi models
- High print speed of up to 10 inches per second
- User-changeable print head and platen mechanism for faster maintenance
- Supports longer lengths of labels and ribbon for reduced downtime
- Supports core-based media
- RFID ready, via optional add-on RFID kit
- Easy operation via large LCD and multiple control buttons and status indicators
- ODV option
- Rich emulation of printer languages (IPL, ZPL, DPL, TEC, PGL)
- Supports remote control and troubleshooting via a network utility
- Built-in support for USB 2.0, IEEE1284 and RS-232C interfaces
- Supports 802.11g Wireless and standard Wired LAN through optional interface cards
- Competitively priced

All printer parameters are programmable using the front panel controls and via software. All popular bar codes, including 2-D codes, eight human-readable fonts with two Care Symbol fonts and a fast and efficient vector font, are resident in memory, providing literally thousands of combinations of type styles and sizes.

1.1 GENERAL SPECIFICATIONS (CONT'D)

Specification/ Model Name		GL408*e*	GL412*e*	
Print method		Thermal transfer or direct thermal		
Head density		8 dots/ mm (203 dpi)	12 dots/ mm (305 dpi)	
Print valid range (width)		104 mm x pitch 2514 mm		
		Not printable for 3 mm from the rear edge		
Print speed		2,3,4 (Default),5,6,7,8,9,10 inches/sec		
		Note: Maximum speed may be further dependent on the type of print layout, paper, or carbon ribbon in use.		
Paper Thickness		0.060 mm to 0.268 mm supported. **Note:** Be sure to use only printer supplies manufactured or certified by SATO.		
Label size (mounting and cardboard size)	**Standard**	Width: 22 to 128 mm (25 to 131 mm) Pitch: 6 to 397 mm (9 to 400 mm)		**Note:** Supported sizes may be regulated due to the quantity of print jobs or size of paper. Other usage conditions may restrict the range of label sizes supported.
	Tear off	Width: 22 to 128 mm (25 to 131 mm) Pitch: 17 to 397 mm (20 to 400 mm)		
	Peel	Width: 22 to 128 mm (25 to 131 mm) Pitch: 17 to 397 mm (20 to 400 mm)		
	Cutter	Width: 22 to 128 mm (25 to 131 mm) Pitch: 17 to 397 mm (20 to 400 mm)		
	Non-separate	Width: 22 to 128 mm (25 to 131 mm) Pitch: 17 to 397 mm (20 to 400 mm)		
Number of loadable sheets	**Roll paper**	Maximum external diameter: 265 mm (Approximately 150 m/roll, 3-inch paper tube used) or 230 mm for 1.5" or 4" cores Back winding (only front winding for linerless mode)		
	Fanfold paper	Maximum folded height: 200 mm See the section in this manual on Setting Fanfold Paper		
Carbon ribbon **Width** **Length** **Thickness of base material** **Color** **Winding direction**		***Be sure to use the specified carbon ribbon manufactured by SATO.*** 39.5, 45, 59, 76, 84, 92, 102, 111, and 128 mm Use a carbon ribbon that is wider than the paper used (450 m/roll max) 4.5 µm (for 450mm maximum roll length) Black (standard), other colors also available Front winding and back winding		
Internal Memory		8MB Flash, 32MB DRAM, with additional 1.426 MB interface buffer		
Label dispensing modes		Continuous, tear off, peeler, dispenser and non-separate		
Dimensions		W 271 mm x D 455 mm x H 305 mm x (Standard)		
Weight		15 kg (for a standard configuration)		
Power supply		Input voltage: AC 100 V to 240 V ±10% Power consumption: Maximum 200 VA 150 W, print rate 30% (89 VA 40 W on standby)		
Operating Environment		Operational ambient temperature: 0 to 40 ×C Operational ambient humidity: 10 to 90% (without condensation) Storing ambient temperature: -5 to 60 ×C Storing ambient humidity: 10 to 90% (no condensation) (Paper, and carbon ribbon excluded)		

1.1 GENERAL SPECIFICATIONS (CONT'D)

Specification/ Model Name		GL408*e*	GL412*e*
Interfaces		**Standard built-in connections for:** • RS-232C (DB 9-pin female serial) XON/XOFF Status 2/3/4/5 • Centronics • USB 2.0 • IEE1284 (ECP compatible) • Diagnostic Serial Port (debug port) **Optional interface boards:** ¤ LAN (10BASE-T/ 100BASE-TX automatic changeover) ¤ Wireless LAN (IEEE802.11g)	
Operation Panel	**Buttons**	LINE, FEED, FUNCTION, ENTER, CANCEL plus 4 navigation buttons (up/down/left/right)	
	Switch	POWER ON/OFF	
	LCD	Green LCD (with backlight), Vertical 64 dots x horizontal 128 dots	
	LEDs	POWER, ONLINE, STATUS (red for error, green for data buffer status) LABEL, RIBBON (for ribbon/label end or near-end warning)	
Sensors		**For Print Head:** Print Head unlatched status **For labels:** Reflection type (I-Mark sensor) Penetration type (Gap sensor) Label end and near-end	**For Ribbons:** Ribbon end and near-end **Optional:** Cutter Open detection Ribbon Fully Rewound detection
Memory cartridge		32MB optional FLASH ROM	
Print Format		Transmitted from host (computer) or recalled from print formats stored by user on memory card (optional)	
Stored Font Types	**Standard**	U, S, M, OA, OB, XB, XL, XU, XS, XM, WB, WL, Raster Font A, Raster Font B, Vector Font (Outline Font)	
	Optional Truetype Fonts	Separate language cartridges are available, preloaded with Japanese, Chinese, Korean, Thai, English, European language fonts	
	Character Sets	ISO 8859-1 (Latin 1), ISO 8859-2 (Latin 2), ISO 8859-9 (Latin 5), CP 855 (DOS Cyrillic), CP 864 (DOS Arabic), CP 850 (Multi-Latin 1), CP 737 (DOS Greek), OCR-A, OCR-B	
Host Applica-tions	**Sato Label Gallery**	Label Management Software, Firmware Tool, Font/Logo tool	
	PrintNet	Configuration Editor, Flash File Manager, File Download, Operator Panel, Information Capture, Validation, ODV Quality Wizard, Speed Keys, Job Capture	
	Advanced Tool Kit	CST Manager	
	ODV Data Manager	Remote Management Verification Tool	
	EPC Data Manager	Automated Barcode Quality Control Tool	
	XML	XML Forms Printing	
	PXML	PXML Device Management	

1.1 GENERAL SPECIFICATIONS (CONT'D)

Specification/ Model Name		GL408*e*	GL412*e*
Barcode	**One-dimensional code**	• UPC-A/E, EAN8/13, JAN8/13 • NW-7 • INTERLEAVED 2 of 5 (ITF) • INDUSTRIAL 2 of 5 • MATRIX 2 of 5 • CODE39, CODE93, CODE128 • UCC/EAN128 • Customer barcode • RSS-14	
	Two-dimensional code	• QR code model 2, Micro QR (Ver 8.1) • PDF417 (Ver. 2.4, including micro PDF) • MAXI code (Ver. 3.0) • Data matrix ECC200 (Ver. 2.0) • Synthetic symbol (UPC-A/E, EAN8/13, JAN8/13, CODE39, CODE128 CC-A/B/C supported with RSS-14)	
Magnification L1 to L12		Vertical 1 to 12 times Horizontal 1 to 12 times (characters)	
Rotation		Characters: 0°, 90°, 180°, and 270° Barcode: parallel 1, serial 1, parallel 2, serial 2	
Barcode Ratio		1:2, 1:3, 2:5, user defined	
User mode		Print Speed, Print Darkness, Pitch Offset, Print Offset, Zero Slash setting, Proportional Pitch, Kanji Font management (where applicable)	
Automatic diagnostics		Head check/ Head open/ Paper end/ Ribbon end/ Winding full/ Kanji ROM check/ Test print/Hex Dump	
Built-in Functions		• Printer Status Monitoring • Graphics printing support • Sequential numbering • Custom Character Storage (volatile) • Character Correction function • Black/White inverted print • Line and Box graphics primitives • SATO Barcode Programming Language (SBPL)/SATO Graphics Language (STGL) support	• Form Overlay printing • Hex Dump function • Format Memory function • Outline font function • Label pitch detection overide function • Zero slash function • JIS/Shift JIS switching (where applicable) • JIS/Shift JIS switching (where applicable) • Emulations for Printronix, Zebra, TEC, Inter mec and Datamax Graphics Languages
Noise emis-sion	**Radiant noise**	VCCI Class B	
	Static electricity	IEC Level 3	
	AC line noise	1000 Vp-p or more (50 nS to 1 µS pulse)	
Optional accessories		• Cutter unit and tray (Guillotine Cutter) • Dispenser unit with backing paper rewinder • Internal rewinder • Simplified dispenser • Linerless Kit • RFID Kit • Online Data Verification System for barcode verification and tracking (TBA)	

1.1 General Specifications (Cont'd)

Specification/ Model Name		GL408*e*	GL412*e*
RFID Kit Regulatory compliance	**UHF RFID**	• U.S./Canada • Europe • Singapore • China • Korea	FCC15B/FCC15C R&TTE (EN300-220-1/EN302-208-1) IDA --- MIC
RFID Tag options	**UHF RFID**	• EPC Class 0+ (TBD) • EPC Class 1 (TBD) • UCODE EPC 1.19 (TBD) • GEN 2	

Note: All the GL printers use the same command codes. The only differences are the allowable values representing print positions on the label. These values are specified in "dots" and will vary depending upon the resolution of the printer and the amount of memory available for imaging the label.

1.1 General Specifications (Cont'd)

Specification/ Model Name	GL408*e*	GL412*e*
Americas	• USA: Underwriters Laboratories - UL60950-1, First Edition - Safety of Information Technology Equipment, Including Electrical Business Equipment by a Nationally Recognized Test Lab (NRTL). • Canada: UL/C-UL 60950-1 First Edition. • USA: Federal Communication Commission (FCC) - The Code of Federal Regulations, Title 47, Part 15, Paragraph 15.3, Class B digital device. • Canada: Industry Canada Standard ICES-003, Issue 3. • Mexico: NOM certification • Argentina: IRAM (S-Mark) certification	
European CE Mark	• EN 60950 - Safety of Information Technology Equipment, Including Electrical Business Equipment, with Amendments 1-3. • EN 55022:1998 +A1 (2003) - Limits and Methods of Measurement of Radio Disturbance Characteristics of Information Technology Equipment • EN 55024:1998 - Electromagnetic Immunity Requirements for Information Technology Equipment • EN 61000-3-2:1995 + A1 (1998) and A2 (1998) - Electromagnetic compatibility (EMC) or, alternatively, EN 61000-3-2:2000 • EN 61000-3-3:1995 + A1 (2001) - Voltage fluctuation and flicker	
Central European Countries	• EN55022:1998 + A1 (2000) - Limits and Methods of Measurement of Radio Disturbance Characteristics of Information Technology Equipment EN 50082-1 (1992) - Immunity residential, commercial and light industry	
Russia	EN55022:1998 with Amendment A1:2000, EN 50082-1 (1992), EN 60555-2:1987, GOST R51317.33-99	
Australia/New Zealand	C-Tick Mark compliance to AS/NZS 3548:1995 with Amendment 1:1997 and Amendment 2:1997 and to AS/NZS CISPR 22:2002	
China	China Compulsory Certification (CCC) mark. CPCS certification to GB 9254-1998, GB 17625.1-2003, and GB 17625.2-1999 by CNCA (Certification and Accreditation Administration of the People's Republic of China)	
Taiwan	BSMI certification as defined in the publication Official Gazette No. 13438, Limits and Methods of Measurement of Radio Interference Characteristics of Information Technology Equipment, (CNS 13438), dated May, 1997.	
Korea	MIC certification as defined in MIC Notice No. 2000-79 (October 21, 2000), MIC Notice No. 2000-182 (October 27, 2000), MIC Notice No. 2000-80 (October 21, 2000), and MIC Notice No. 2000-183 (October 28, 2000) plus the immunity requirements outlined in KN 61000-4-2, KN 61000-4-3, KN 61000-4-4, KN 61000-4-5, KN 61000-4-6, KN 61000-4-8, and KN 61000-4-11 (equivalent to IEC 61000-4-x).	
Singapore	IDA certification	

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INSTALLATION

This section assists you in unpacking and installing the printer from the shipping container. You will also be guided through a familiarization tour of the main parts and controls. The following information is provided:

- Safety Precautions
- Unpacking and Parts Identification
- Loading the Carbon Ribbon
- Loading Labels and Tags
- Adjusting the Sensors
- Replacing the Print Head
- Turning the Printer ON/OFF

SAFETY PRECAUTIONS

Please read the following information carefully before installing and using the printer

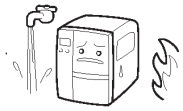
THE CAUTION SYMBOL ⚠

Whenever the triangular Caution logo appears in this manual, pay special attention to the warning(s) cited below it. Failure to abide by the warnings may result in injury or damage to property.

PRINTER PLACEMENT TIPS

- Place the printer on a solid, stable, horizontal surface that is not subject to strong vibrations from adjacent mechanical devices.

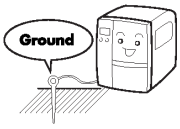
- Avoid shaky or slanting tables, or platforms that are liable to collapse under a heavy weight. If the printer is dropped or damaged, immediately turn off the power, pull out the power plug and contact a service center. In this case, continued use of the printer may cause a fire or electric shocks.
- Avoid installing the printer in direct sunlight, or in dusty, very hot or slippery areas. Also avoid placement in damp, unventilated or humid areas. If condensation forms, immediately turn off the power, and do not use the printer until the condensation disappears. Otherwise the moisture may cause electric shocks.
- Avoid placing the printer near large high-current equipment, as such equipment can cause spikes or undervoltages in the power supply.
- Do not leave containers of water or chemicals around the printer. If any liquid is spilled onto the printer, immediately turn off the power, pull out the power cable from the AC outlet, and contact a sales outlet, dealer, or service center. In this case, continued use of the printer may cause fires or electric shocks.



- Do not move the printer with any paper loaded. The stack of paper may fall off, causing trips and accidents.
- When laying the printer down, be careful not to catch your foot or fingers under it.
- When moving the printer, be sure to pull out the power cable from the AC outlet, and check that any other external interface cables have been disconnected. Otherwise, the connected cables may be damaged, or may cause trips and falls, in addition to or a fire or electric shocks.

ELECTRICAL PRECAUTIONS

- Do not damage, break, or process the power cable. Hanging heavy objects on it, heating or pulling it may damage the power cable and cause fires or electric shocks.
- When the power cable is damaged (cable conductors are exposed or cut, etc.), contact a sales outlet, dealer, or service center. In this case, continued use of the printer may cause fires or electric shocks.
- Do not process, forcibly bend, twist, or pull the power cable. Continued use of such a cable may cause fires or electric shocks.
- If the printer emits any smoke or peculiar odors at any time, turn it OFF and prevent further usage until you have contacted a qualified service personnel.
- Do not use any other voltage except the specified power voltage for the printer that matches your domestic power supply. Otherwise, it may cause fires or electric shocks.
- Do not operate the power switch or handle the power cable with a wet hand.
- Do not insert or drop anything metallic or flammable into the openings of the printer (the cable outlet or mounting hole of the memory cartridge). Otherwise, immediately turn off the power, pull out the power cable, and contact a sales outlet, dealer, or service center. In this case, continued use of the printer may cause fires or electric shocks.
- To reduce electrical risks, be sure to connect the printer to ground before use. Also, try not to share the printer's AC outlet with other electrical equipment, especially those that draw high amounts of current or cause electrical interference.



GENERAL PRECAUTIONS	
• The supplied head cleaning liquid is flammable. Never heat it or throw it into a fire. Keep it out of children's reach to avoid accidental consumption. Should this occur, consult a doctor immediately. • When opening/closing the cover, beware of getting your fingers caught. Also, hold the opening/closing cover well so that it will not slip and fall on your hand. • After printing, the print head remains hot. When replacing paper or cleaning the printer immediately after printing, be careful not to burn yourself. • Touching even the edge of the printer head may cause injuries. When replacing paper or cleaning the printer, be careful not to hurt yourself. • If the printer will not be used for extended periods of time, disconnect the power cable for safety. • When releasing and locking down the printer head, be careful not to catch any other foreign matter in it except label paper.	• Do not disassemble or perform modifications to the printer, as this renders the product unsafe. For maintenance, troubleshooting and repairs, consult a sales outlet, dealer, or service center for help, instead of attempting to perform this yourself. Renewable annual service contracts are available. • When maintaining or cleaning the printer, always disconnect the power cable for safety. • Do not insert your hand or other objects into the cutter. • When loading roll paper, be careful not to catch your fingers between the paper and the feeder. • Be careful not to hurt yourself when detaching the back cover of the fanfold through the hole and attaching it. • The simplified cutter (where installed) is structured as a blade. Be careful not to cut yourself.

This equipment is a piece of Class B information technology equipment based on the standards of the Voluntary Control Council for Interference by Information Technology Equipment (VCCI). Although this equipment is for use in home environment, if it is used close to a radio or television set, it may cause poor reception. Handle it properly in accordance with the content from the instruction manual.

SECTION 2: INSTALLATION

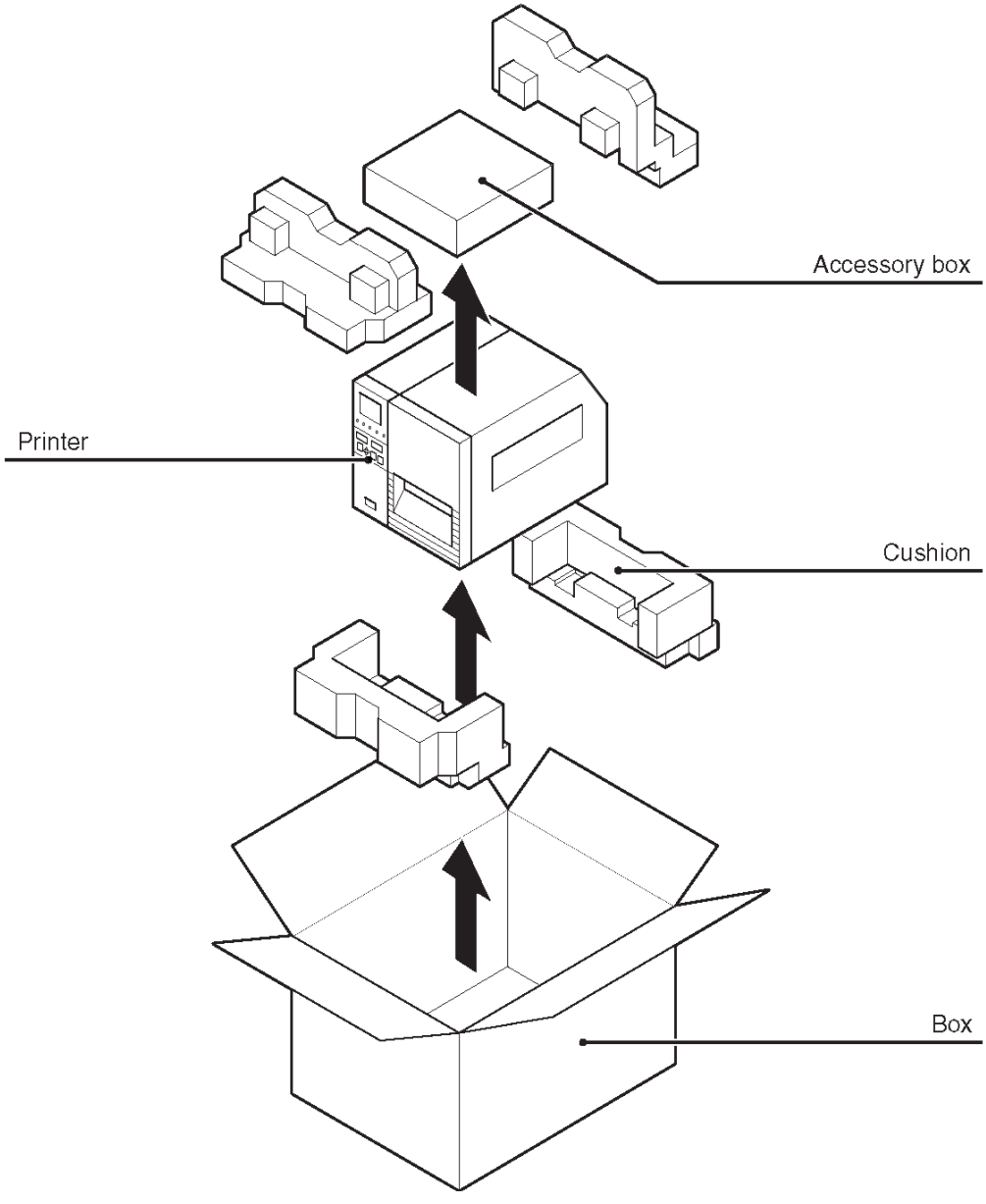
2.1 UNPACKING

When unpacking the printer, take note of the following:

1 The box should stay right-side up. Lift the printer out of the box carefully.	**4** If the printer was been stored in the cold, allow it to reach room temperature before turning it on.
2 Remove the plastic covering from the printer.	**5** Set the printer on a solid, flat surface. Inspect the shipping container and printer for any sign of damage that may have occurred during shipping.
3 Remove the accessory items from their protective containers.	

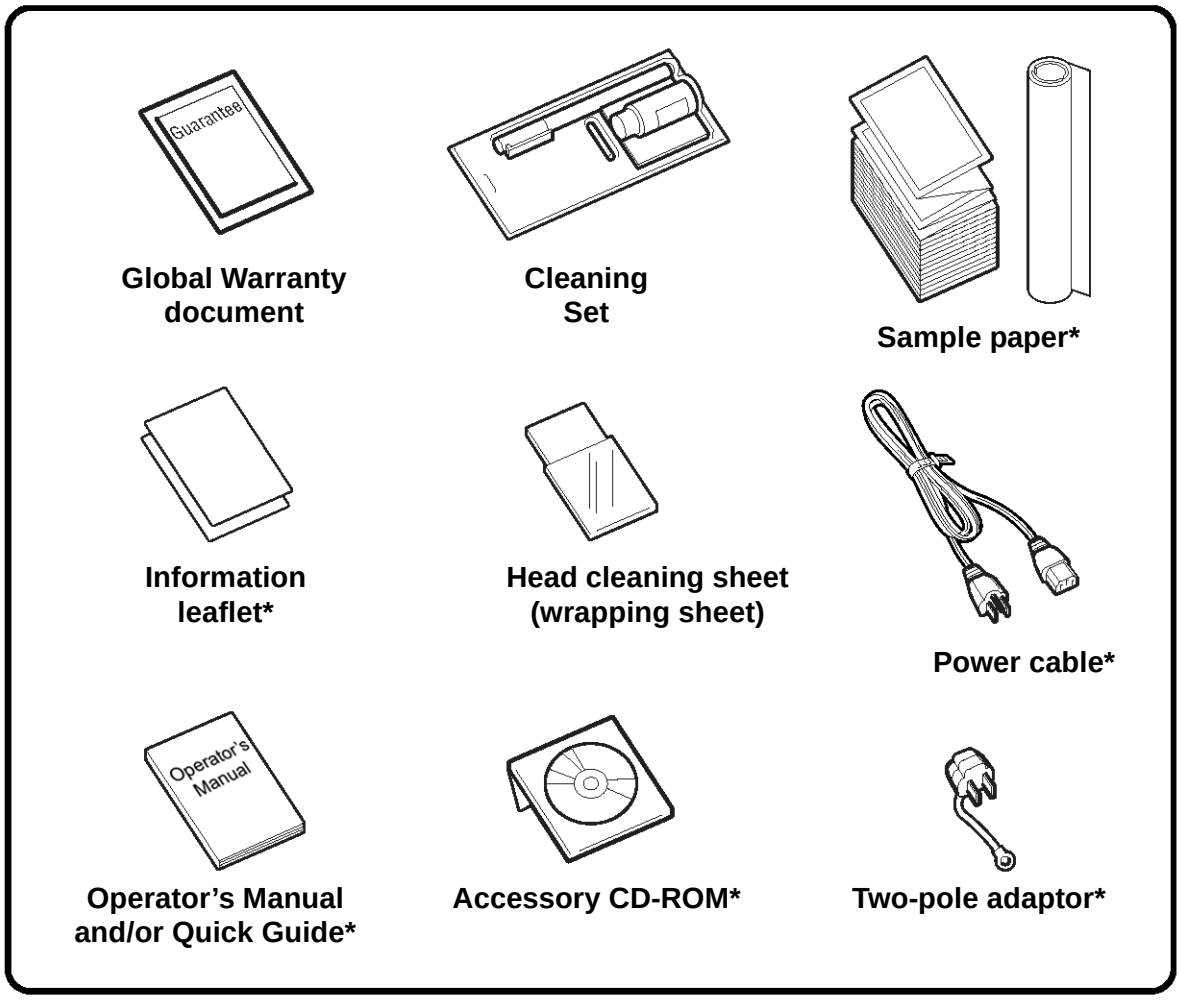
Note

The following illustrations are representative only. Your printer may not be packed exactly as shown, but the unpacking steps are similar.

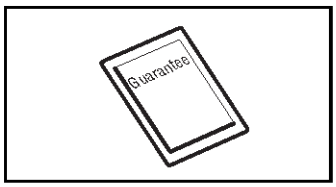


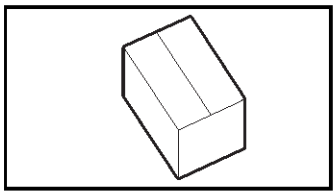
2.1.1 INCLUDED ACCESSORIES

After unpacking the printer, verify that the following materials are in the accessories or packaging:



Items marked with an asterisk may be different from what you see here, or may be excluded.





Important!

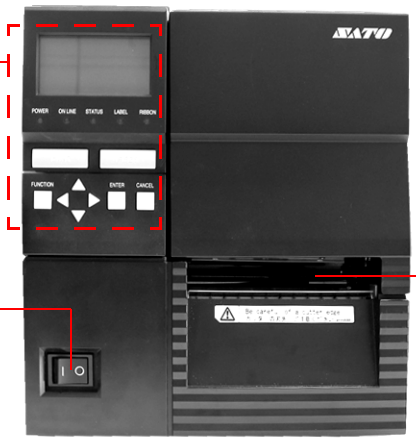
Please fill out the Global Warranty card and submit it to us in order that we can provide fast and efficient after-sales service. For malfunctions under **normal use**, this product will be repaired free of charge according to the warranty terms applicable for the country of use.

Please do not discard the original packaging box and cushioning material after installing the printer. They may be needed in future, if the printer needs to be shipped for repairs.

2.1.2 PARTS IDENTIFICATION

IDENTIFYING THE MAIN PRINTER PARTS

Front View



Operation Panel

Consists of an liquid crystal display screen, five status indicators and the LINE and FEED buttons.

Power switch

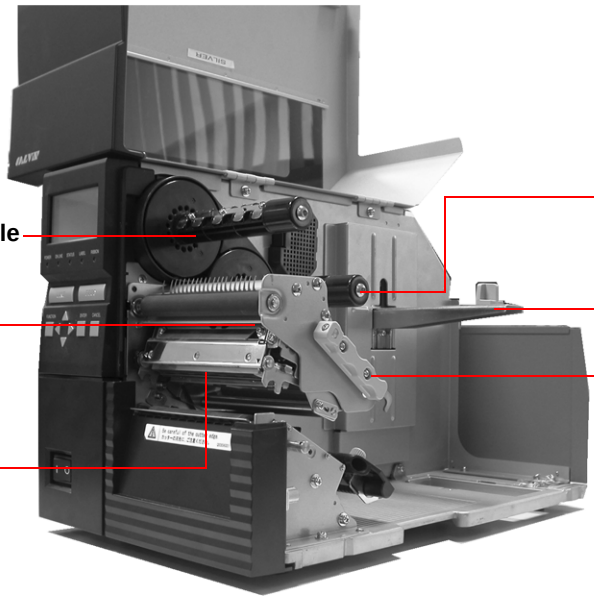
Pushing the I side turns the printer ON. Pushing the O side turns the printer OFF.

Label Output area

This is where the label feeds out of the printer after being printer.

Note:
Depending on the region of manufacture, your unit of the printer may appear slightly different in some areas from the model depicted here.

Angled Front View



Printer Cover
(lifted up)

Ribbon Take-up Spindle

Head pressure adjustment knob (visible when print head is latched)

Print Head assembly

Ribbon Supply Spindle

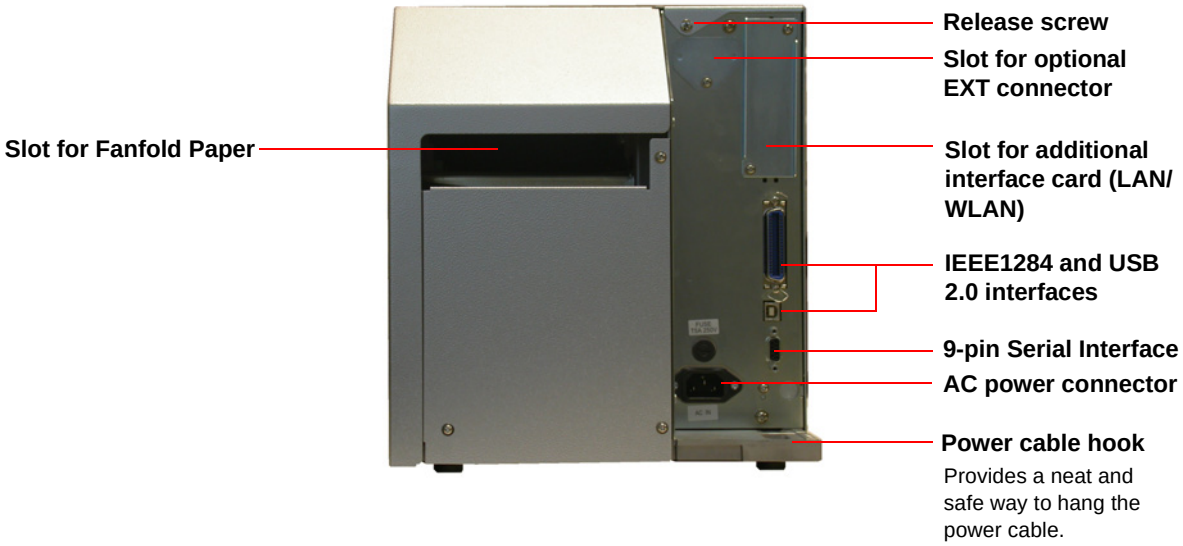
Label supply arm

Head lock lever

2.1.2 PARTS IDENTIFICATION (CONT'D)

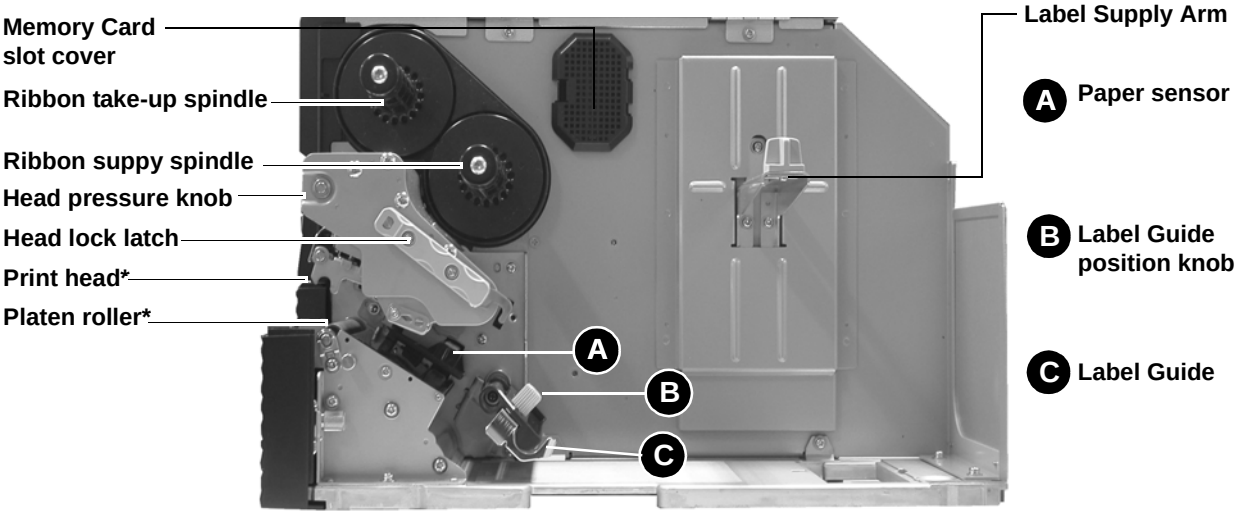
IDENTIFYING THE MAIN PRINTER PARTS

Rear View



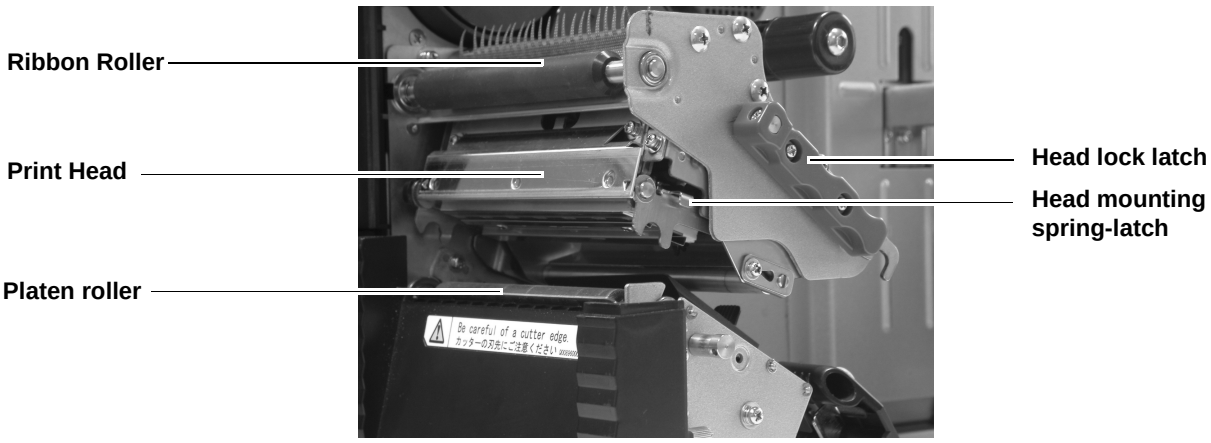
IDENTIFYING THE MAIN PRINTER PARTS

Side View
(Media assembly)



*** Clean and maintain this part regularly**

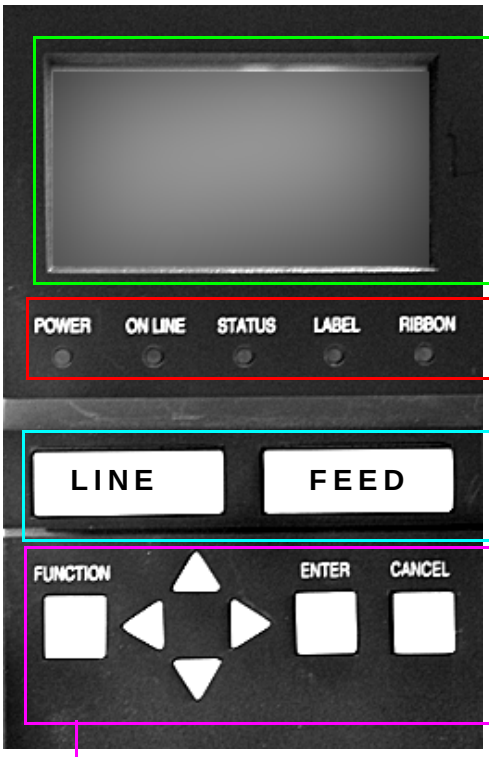
Angled Front View



2.1.2 PARTS IDENTIFICATION (CONT'D)

IDENTIFYING THE MAIN PRINTER PARTS

View of Front Panel



LCD screen

Icons, prompts and system messages are displayed here.

Light Emitting Diodes

POWER LED: Lights up when power is supplied to the printer.

ONLINE LED: Lights up when communication is available. Flashes with communication fails.

STATUS LED: Lights up and flashes to indicate exchange of data.

CANCEL button: Cancels printing data. In each setting mode, the button also returns you to the previous menu or menu item.

For details of each indicator's behavior, see **Page 5-4 of Section 5, Understanding the STATUS Indicators.**

FEED button

Feeds the label forward. When it is pressed once, the equivalent of a sheet of paper or label is ejected. *There are times when the paper is not aligned properly when power is turned on or when the paper was set. In this case, always press the FEED button to align the paper properly.

LINE button

When pressed, it takes the printer ONLINE of OFFLINE. When certain printer errors occur, the LINE button can be used to cause the printer to recheck the error..

The button is also used in conjunction with the cursor and FEED buttons to navigate menus and confirm the selection of a menu option.

NOTE: When changing to Online mode, if the operator has changed menu items, but not saved the changes in a configuration, the operator will be prompted to save the changes.

Operation buttons

FUNCTION button: Selects the various setting modes.

CURSOR buttons: Each button moves the cursor up, down, left or right on the LCD screen.

ENTER button: Confirms the choice of a selection or value.

CANCEL button: Cancels printing data. In each setting mode, the button also returns you to the previous menu or menu item.

2.2 LOADING THE CARBON RIBBON (FOR THERMAL TRANSFER PRINTING)

(Note: Ribbon is not needed for Direct Thermal printing)

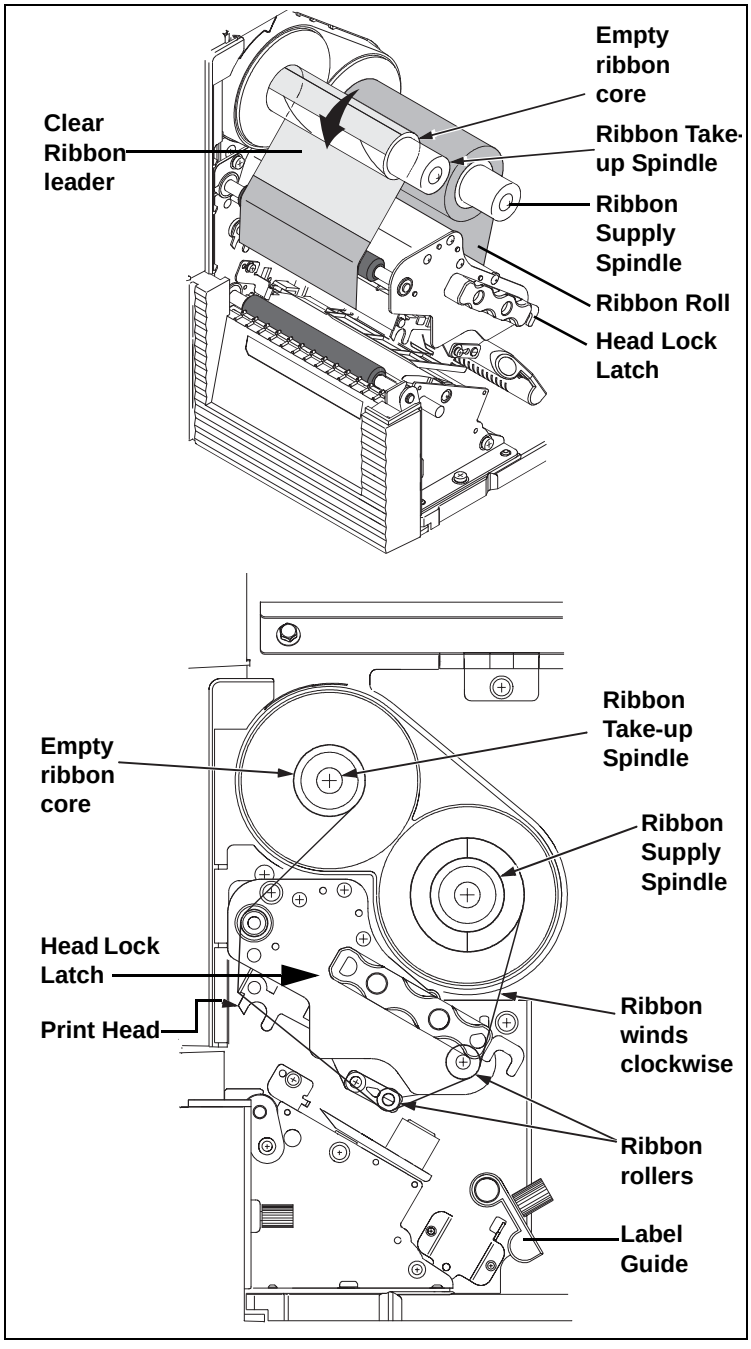
1. Lift up the printer cover. Make sure that the cover rests firmly on the top of the printer so that it will not fall forward and injure your hands.

2. Insert an empty ribbon core on the Ribbon Take-up Spindle.

3. Insert the carbon ribbon in the Ribbon Supply Spindle.
   Push it inwards all the way, with the ribbon winding in a clockwise direction around the print head, as shown. ***Note: Use only genuine SATO carbon ribbons for maximum print quality and printer durability.***

4. Pass the carbon ribbon under the print head to the ribbon take-up shaft. Affix the carbon ribbon directly to the cardboard ribbon core. Use adhesive tape to affix the ribbon to the core.

6. Now remount the print head by pushing down on the head lock latch. The print head should lock into place firmly. You can now proceed to install the label media as described in the following sections.



Note:
Do not install a new carbon ribbon and then wind it over any **used ribbon** in the ribbon take-up shaft. That is, **always remove all used ribbon** from the ribbon take-up shaft (using the purple knob to release the used ribbon) before changing to a new ribbon.

⚠ Caution

- When replacing the carbon ribbon, bear in mind that the print head and its surrounding area remain hot. Keep your fingers away from these areas to prevent injury.
- Avoid touching even the edge of the print head with your bare hands.

ADJUSTING THE RIBBON GUIDE

(Note: Ribbon is not needed for Direct Thermal printing)

If the ribbon is not spread smoothly when it makes contact with the media, print voids will occur. This could be due to either the ribbon supply spindle, ribbon take-up spindle, printhead or ribbon guide rollers not being parallel. Thus you may need to perform the following procedures repeatedly until you reach the desired results.

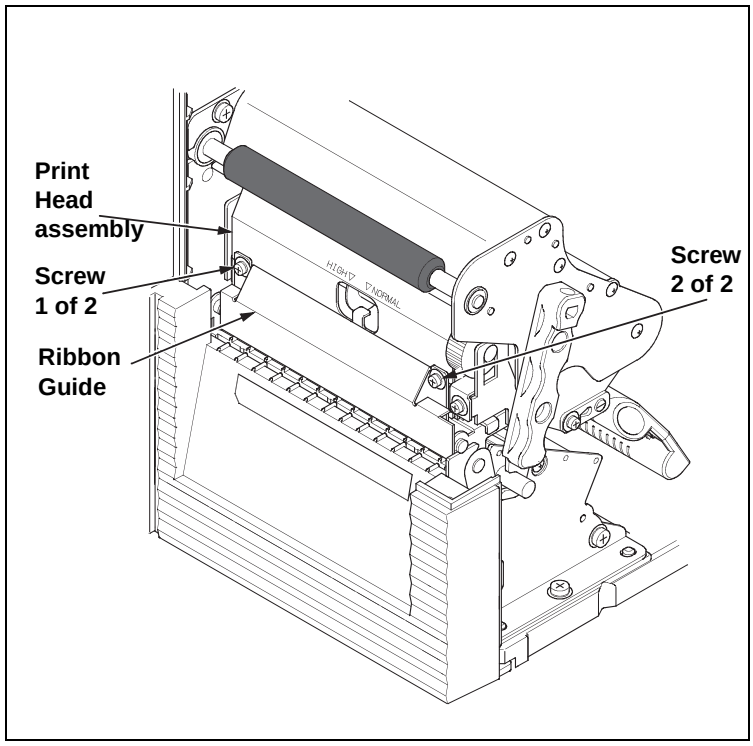
1. Loosen the screws on each end of the ribbon guide.

2. Adjust the ribbon guide vertically to make sure that the ribbon guide axis is parallel with the entire print head assembly.

3. Tighten the screws on each end of the ribbon guide.

4. Print a test label to check for correctness.

6. Now remount the print head by pushing down on the head lock latch. The print head should lock into place firmly. You can now proceed to install the label media as described in the following sections.

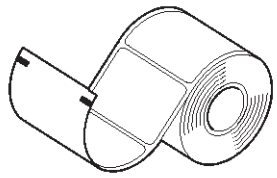


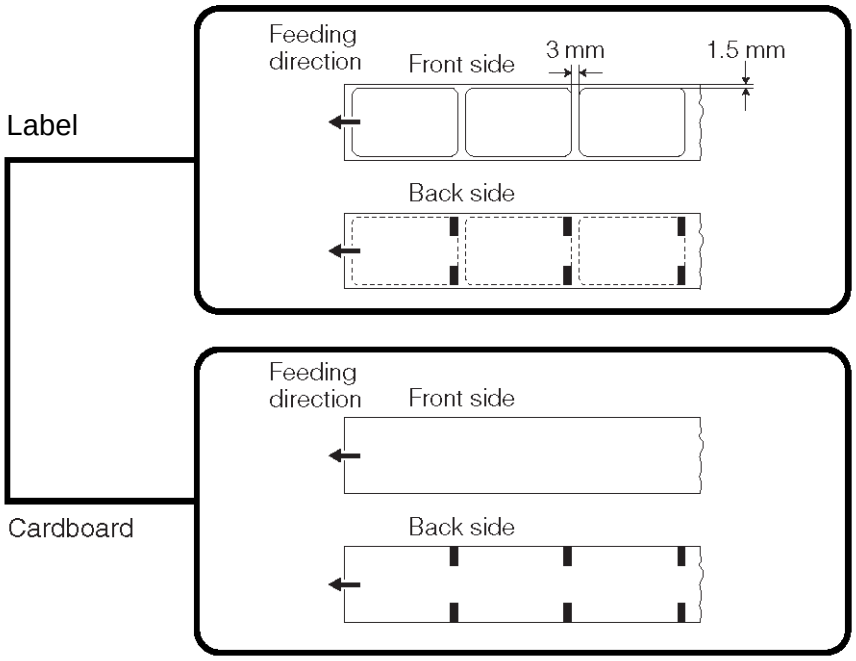
2.3 LOADING LABELS AND TAGS

This printer can print on **roll paper** and **fanfold paper**.
The method of setting paper is different with roll paper and fanfold paper.
This printer can be set to detect the I-mark on the paper to feed each label correctly.

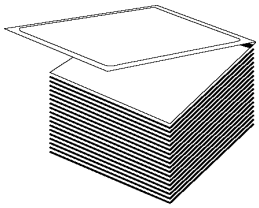
Note:
For optimal print performance and durability, **please use SATO-certified label and ribbon supplies on this printer.** Using supplies not tested and approved for use by SATO can result in unnecessary wear and damage to vital parts of the printer, and may void the warranty.

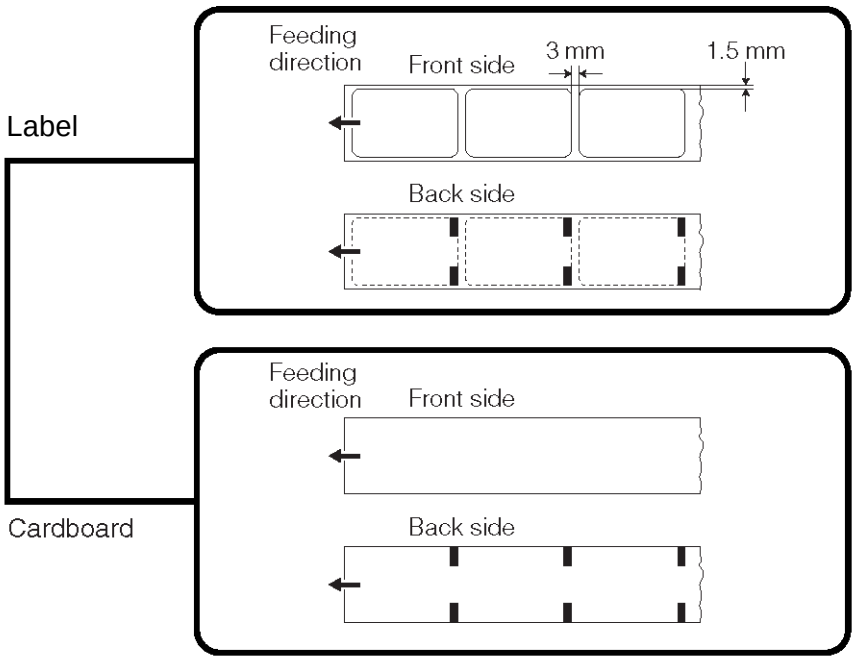
Roll Paper Characteristics





Fanfold Paper Characteristics

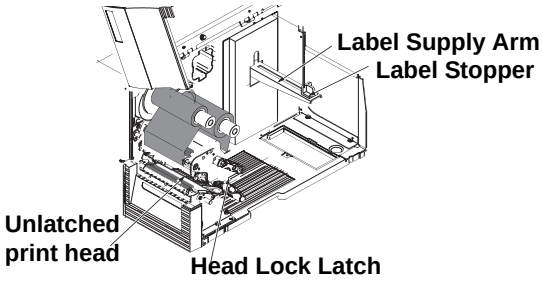




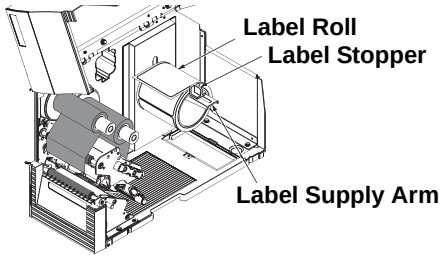
2.3 LOADING LABELS AND TAGS (CONT'D)

2.3.1 Loading Roll Paper

1. Lift up the main cover. Make sure that the cover rests firmly on the top of the printer so that it will not fall forward and injure your hands.

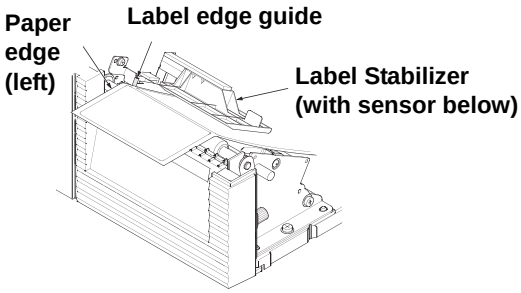


2. Release the purple Head Lock Latch by pulling it upwards counterclockwise. The print head assembly will be lifted up to allow label loading.



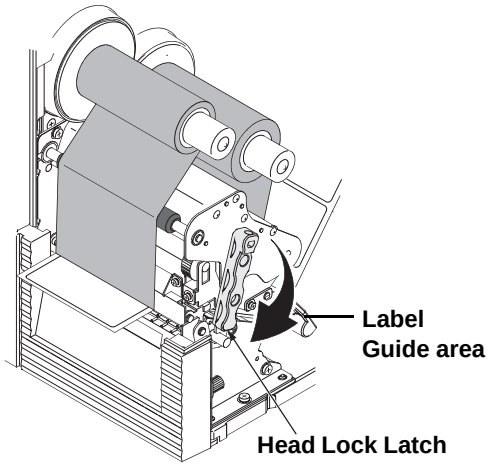
3. Route the label into the print head area, going under the black plastic label stabilizer and over the platen roller, as shown here. Make sure the left edge of the label presses against the label edge guide.

4. Adjust the label guide so that it presses against the label's right-side edge.



5. Turn the Head Lock Latch clockwise to latch the entire print head assembly into place. The label and ribbon will also be firmly latched into contact. The illustration on the right shows you how the printer looks like after all ribbon and labels have been loaded correctly.

6. If desired, close the main cover and do a test print to check that the label roll has been loaded properly. Be careful not to get your fingers caught at the bottom ledge when you are closing the main cover.



Completed Label and Ribbon Loading

⚠ Caution

- When replacing paper, bear in mind that the print head and its surrounding area remain hot. Keep your fingers away from these areas to prevent injury.
- Avoid touching even the edge of the print head with your bare hands.

2.3 LOADING LABELS AND TAGS (CONT'D)

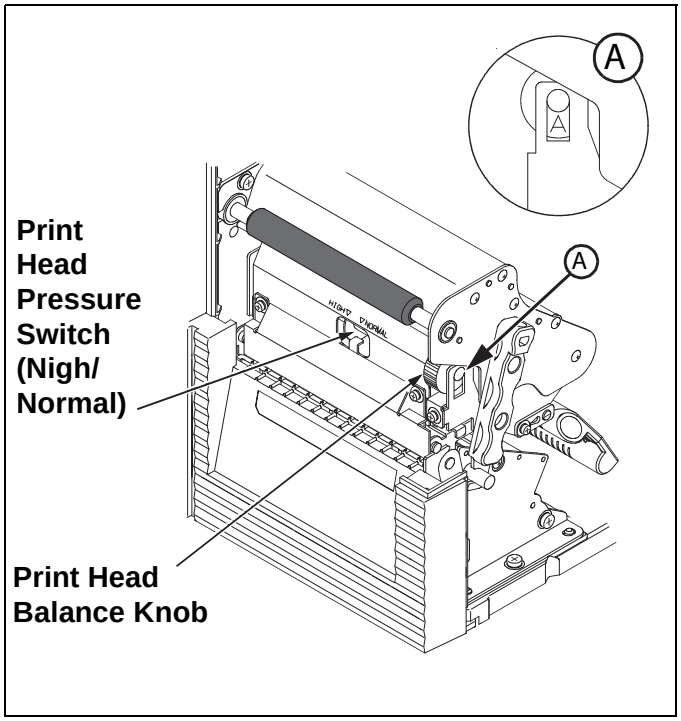
Adjusting for the paper width and print head balance
This printer is adjusted so that quality printing can be obtained without any adjustments. However, in certain situations, you will need to adjust printhead pressure because of variations in media width. The printhead pressure switch (shown above) has two positions, high and normal. By following this procedure, you will minimize printhead wear.The head pressure balance knob adjusts the amount of pressure being applied along different sections along the length of the print head.

For suggested settings of the Pressure Switch and Balance Knob (1 to 5), see the table below:

SETTING	PRESSURE FOR VARIOUS MEDIA TYPES
Normal	0.08 to 0.20 (Thin paper, normal label, etc.)
High	0.20 to 0.268 (Thick paper, tag stock, etc.)

SETTING	BALANCE
A	Allow print head pressure switch setting
1	1.00 to 1.69”
2	1.7 to 2.39”
3	2.4 to 3.09”
4	3.1 to 3.79”
5	3.8 to 4.00”

Note:
Adjustments are only necessary if print quality is not satisfactory. Otherwise, you do not need to vary the head pressure balance.



2.3 LOADING LABELS AND TAGS (CONT'D)

2.3.2 Loading Fanfold Paper from the rear

1. Lift up the printer cover. Make sure that the cover rests firmly on the top of the printer so that it will not fall forward and injure your hands.

2. Place the stack of fanfold paper at the rear of the printer. Remove the release screw that holds the cover of the fanfold paper slot. Keep the screw in a safe place for easy retrieval later.

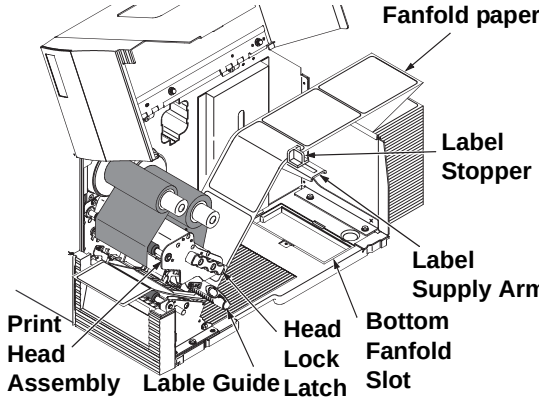
3. Pull the leader label into the printer, over the Label Supply Arm, and push the Label Stopper against the edge of the label so that the label will not meander during operation.

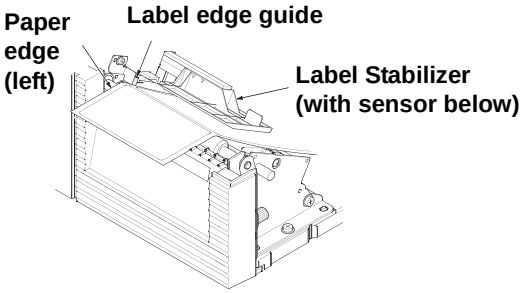
4. Route the label into the print head area, going under the black plastic label stabilizer and over the platen roller, as shown here. Make sure the left edge of the label presses against the label edge guide.

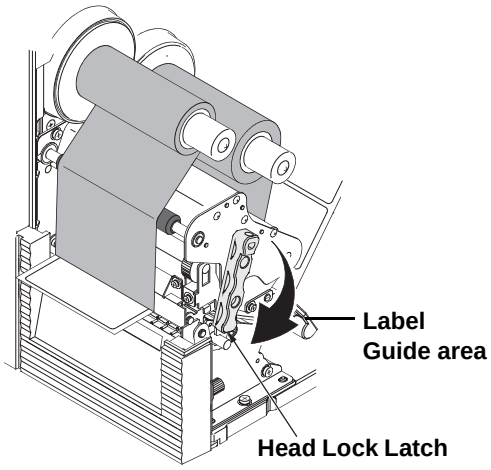
5. Adjust the label guide so that it presses against the label's right-side edge.

6. Turn the Head Lock Latch clockwise to latch the entire print head assembly into place. The label and ribbon will also be firmly latched into contact. The illustration on the right shows you how the printer looks like after all ribbon and labels have been loaded correctly.

7. If desired, close the main cover and do a test print to check that the label roll has been loaded properly. Be careful not to get your fingers caught at the bottom ledge when you are closing the main cover.







Completed Label and Ribbon Loading

Note:
The procedure described above is recommended for loading a stack of fanfold paper that is 20 cm to 30cm in height. Higher stacks should be loaded from below the printer. (See next section)

⚠ Caution

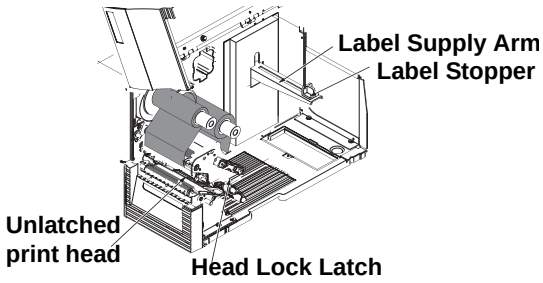
- When replacing paper, bear in mind that the print head and its surrounding area remain hot. Keep your fingers away from these areas to prevent injury.
- Avoid touching even the edge of the print head with your bare hands.

2.3 LOADING LABELS AND TAGS (CONT'D)

2.3.3 Loading Fanfold Paper from under the printer

1. Lift up the main cover. Make sure that the cover rests firmly on the top of the printer so that it will not fall forward and injure your hands.

2. Release the purple Head Lock Latch by pulling it upwards counterclockwise. The print head assembly will be lifted up to allow label loading.



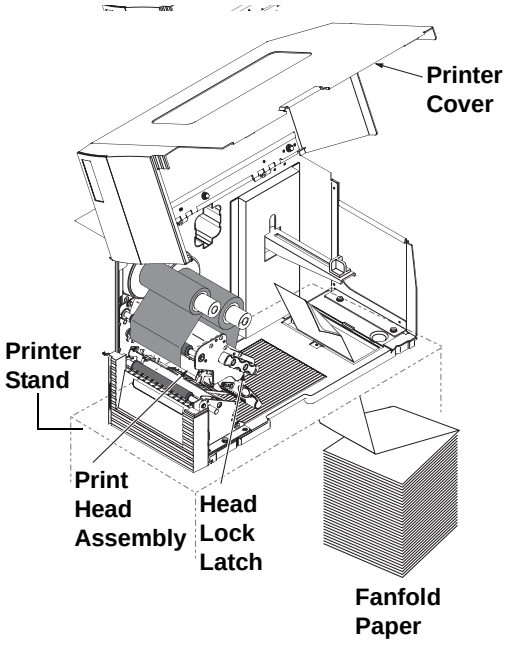
Note:
It is assumed that the printer is supported on stands to allow fanfold paper to be loaded from beneath the printer.

3. Unscrew the fanfold cover at the bottom of the printer. Keep the cover and the screw in a safe place for future use.

4. Load the stack of fanfold paper straight up through the bottom fanfold loading slot.

5. Pull the label into the chassis and then into the print head assembly.

6. Proceed to load the label as described in **"2.3.1 Loading Roll Paper" on page 2-13.**



7. Pass the paper under the label guide and paper sensor. Loosen the label guide knob, and adjust the slide guide so that it lightly touches the edge of the paper. Now fasten the label guide knob tightly.

8. Remount the print head by pushing down on the head lock lever. The print head should lock into place firmly.

9. If desired, close the main cover and do a test print to check that the label roll has been loaded properly. Be careful not to get your fingers caught at the bottom ledge when you are closing the main cover.

⚠ Caution

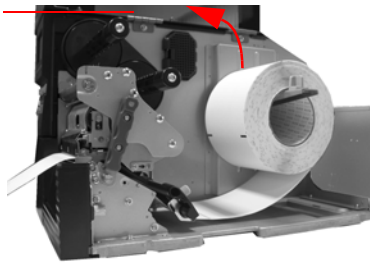
- When replacing paper, bear in mind that the print head and its surrounding area remain hot. Keep your fingers away from these areas to prevent injury.
- Avoid touching even the edge of the print head with your bare hands.

2.3 LOADING LABELS AND TAGS (CONT'D)

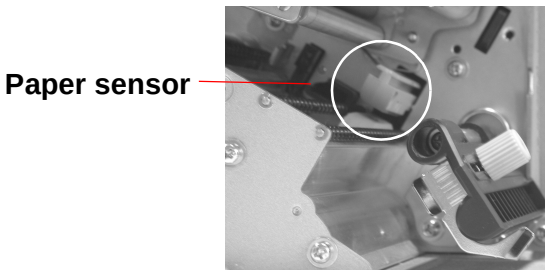
2.3.4 Adjusting the Paper Sensor

Adjustment of the paper sensor is usually not necessary, but the procedure is described here.

1. Lift up the cover. Make sure that the cover rests firmly on the top of the printer so that it will not fall forward and injure your hands.



2. The purple sensor unit is located just above the label damper assembly. (the black plastic label path stabilizer has been removed in the picture). Slide the sensor outwards to adjust its position. Remember to replace the label path stabilizer after the adjustment.



3. You can continue to load media by following the steps in previous sections, or close the front cover.

⚠ Caution

• When closing the printer cover, be careful not to injure your fingers due to a sudden release of the heavy cover.

2.4 REPLACING THE PRINT HEAD

Before attempting to replace the print head, it is advisable to contact your local dealer or service center so that they can assist you in case of problems.

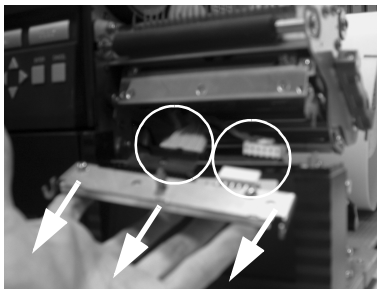
1. Make sure the printer has been turned off for at least 30 minutes so that the print head is not hot. Lift up the main cover.

2. Pull the head lock latch upwards to unlatch the print head assembly. Pull out the print head's spring latch circled in the picture on the right. The print head will be released.

⚠ Caution

• Do not touch the print head's heating elements. If you do so inadvertently, use the cleaning pen (supplied) to clean the area thoroughly. For more details, see Section 4, Cleaning and Maintenance.

4. Pull the print head outwards and disconnect the two connectors (circled in the picture on the right) attached to it. Note the two small U-shaped hooks at the front part of the print head. These will be used for remounting any print head into the printer.



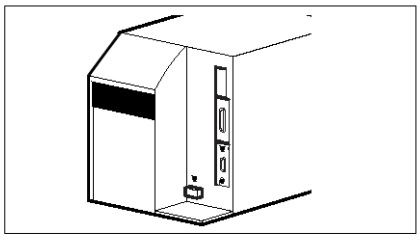
5. Obtain the new print head and attach the two connectors to it.

6. There are two U-shaped hooks (circled in the picture) on the front part of the print head. Insert the left-side hook into the printer first.

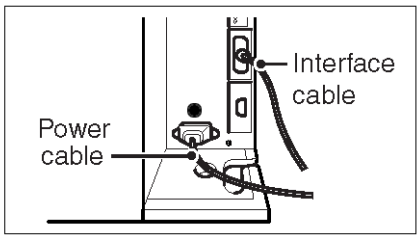
7. Now mount the right-side hook of the print head into the printer, while pushing the spring-latch (circled). The print head should snap into place firmly. If not, release the print head and try again.

2.5 TURNING THE PRINTER ON/OFF

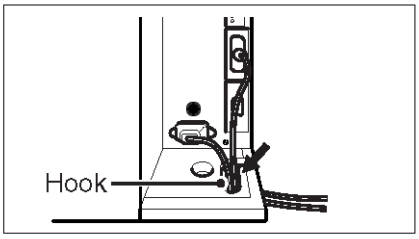
1. After removing the cable cover at the rear of the printer, you can proceed to install the interface and power cables as shown.



2. To limit movement of the cables, you can optionally channel the cables through the cable hook area at the base of the printer.



3. Insert the power cable first to the printer, then connect the other end to the power outlet. If necessary, use an adapter to match the prongs on the power cable to the sockets in the AC outlet.



⚠ Caution

- Always use a grounded power cable to protect against electrical leakage and electrical shocks.

4. To turn the printer ON, press the power switch to the “I” side. When the printer is successfully turned on, the LCD screen will be activated, and a series of diagnostic messages and startup information will be displayed.

⚠ Caution

- To prevent electric shocks, make sure your hands are dry when you operate the power switch, or when you pull out or insert power cables and switches.

5. If the printer does not respond, refer to the **Troubleshooting** section of this manual.

6. Before turning the printer off, perform the following steps:
   Take the printer offline by pressing the Line button.

   - Press the Feed button to eject any label at the front of the printer.
   - Lightly pull the paper diagonally downward to tear off the label.

7. To turn the printer off, press the power switch to the “O” side.

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3

CONFIGURATION AND OPERATION

Before using the printer, it is best to read this manual thoroughly first. Otherwise, you may disturb default settings around which the instructional procedures in this manual are based upon.

3.1 THE LCD AND OPERATION PANEL

The printer can be monitored and controlled and set via the LCD screen and the buttons below.

Overview of the Operation Panel

Icon/Text display area
Eight icons represent the following modes from top left to bottom right: User Mode, Interface Mode, RFID Mode, Emulation Mode, Printer Setup, Media Setup, Configuration Management, and SEMBL Setup.

The same area can also display two lines of alphanumeric text instead, providing a total of three lines of text.

Icon/Text display area
Five LEDs and a built-in speaker provide visual and aural cues regarding printer status and errors.

POWER LED: Lights up when power is supplied to the printer.

ONLINE LED: Lights up when communication is available. Flashes with communication fails.

STATUS LED: Lights up and flashes to indicate exchange of data.

CANCEL button: Cancels printing data. In each setting mode, the button also returns you to the previous menu or menu item.

For details of each indicator's behavior, see **pg 5-4 of Section 5, Understanding the STATUS Indicators.**

Control Buttons
Five buttons and four cursor keys allow fast setting and checking of the various parameters of the printer.

FUNCTION button: Selects the various setting modes.

CURSOR buttons: Each button moves the cursor up, down, left or right on the LCD screen.

ENTER button: Confirms the choice of a selection or value.

CANCEL button: Cancels printing data. In each setting mode, the button also returns you to the previous menu or menu item.

3.2 THE ICON-BASED MAIN MENU

Screen icons and menu options

USER Mode (See pg 3-4)
Settings of Print Speed/Darkness, Offsets, Label Setup, etc.

INTERFACE Mode (See pg 3-8)
Settings of USB, Parallel, Serial and other interface options

RFID Mode (Check Service Manual)
Setting of the optional RFID Kit (or ODV Kit) if installed.

Emulation Mode (See pg 3-23)
Settings of emulation for SBPL, DGL, PGL, ZGL, TGL and IGL

ADVANCED Mode (See pg 3-16)
Settings of Sensors, media handling, font handling and advanced features

DIAGNOSTICS Mode (See pg 3-21)
Test prints, printer tests, Hex Dumps. Printer usage statistics logs.

CONFIGURATIONS Mode (See pg 3-23)
Save and Recall various sets of stored system and user settings

Navigating the Iconic Menu
To access the iconic menu above, press the FUNCTION button after taking the printer OFFLINE with the LINE button.

Use the set of four (**<**, **>**, **^** and **v**) cursor keys to **highlight** any of the icons shown on screen.

After highlighting an icon, press the ENTER button in order to access any **sub-menus** related to the mode represented by the icon.

The ENTER button is also used to confirm the selection of any highlighted menu item in any menu or sub-menu.

The CANCEL button acts as a backspace or Escape function to return to a previous sub-menu or menu item.

To exit this iconic menu, press the CANCEL button repeatedly to return to the main screen, then press the LINE button to take the printer ONLINE.

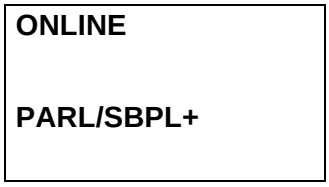
In some menus, a message may inform you that the ENTER button is LOCKED, to prevent the operator from making inadvertent changes to a menu item. Press the **v** cursor key and then press ENTER again in order to access the locked menu item.

3.3 PRINTER OPERATION MODES

ONLINE AND OFFLINE MODES

3.3.1 ONLINE Mode

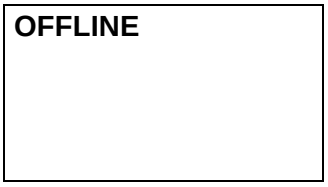
Pressing the **LINE** button causes the printer to go ONLINE or OFFLINE alternately.
When the printer is ONLINE, the following activities will be possible:



- The printer is ready to receive print data from the computer or other connected devices
- The printer is ready to start printing

3.3.2 OFFLINE Mode

When the printer is ONLINE, pressing the **LINE** button once will cause the printer to go OFFLINE.



When the printer is OFFLINE, the activities for ONLINE mode are no longer possible, but the following activities will be possible:

- The printer can eject labels when you press the **FEED** button.
- The printer can be switched to other modes when you press the **ENTER** button.
- Any printing job can be stopped once the printer is brought OFFLINE
- Any printing job can be cancelled once the **CANCEL** button is pressed in OFFLINE mode. The menu for canceling the print job then appears.

- Received data that is stored in the buffer memory can be saved into a memory cartridge, if the **LINE** button is pressed and held down for at least five seconds in OFFLINE mode. The following screens will appear.

3.4 USER MODE

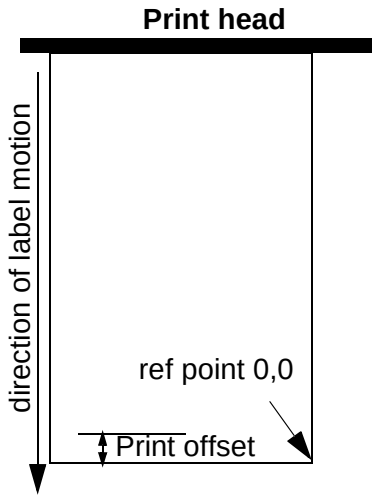
The following settings are available in User Mode:

DISPLAY	SUB-MENU	RANGE	DEFAULT	DESCRIPTION
Print Speed		2 to 10 (50.8 - 254.0 mm/sec)	4 ips (101.6 mm/ sec)	Selects the printing speed. Lower speeds usually yield better print quality. Settings available are dependent on print head resolution.
Print Darkness		-15 to 15	5	Selects the print darkness. Do not increase print darkness to compensate for poor print head condition or maintenance.
Pitch Offset		-0.50 to 0.20 (-12.7 to 5.1 mm)	0.00 mm	See pg 3-5
Vert Print Offset		-1.00 to 12.80 (-25.4 to 152.0 mm)	0.00 mm	See pg 3-6
Hor Print Offset		-1.00 to 1.00 (-25.4 to 25.4 mm)	0.00 mm	See pg 3-6
Label Length		00.1 to 99.0 (3 to 2514 mm)	152 mm)	Sets the length of each label in the label roll to be used
Label Width		00.1 to 04.1 (3 to 104 mm)	104 mm)	Sets the width of the label roll to be used
Slash Zero		Disable/Enable	Disable	Selects whether the character “0” has a diagonal slash across it, to differentiate it from the letter “O”
Character Pitch		Proportional/Fixed	Proportional	Selects whether the spacing between every character is fixed (Fixed) or variable (Proportional) in accordance to character width.
Protocol C. Code		Standard/ Non-Standard	Standard	See pg 3-6
Euro Character		0 to 255	213	Selects the character to represent the Euro currency
Ver BaseRefPoint		-9999 to 9999	0	See pg 3-7
Hor BaseRefPoint		-9999 to 9999	0	See pg 3-7
Mem Select (CC1)		Card/Memory	Card	Selects the default storage memory to be the optional memory cartridge or standard printer memory
Orientation		Portrait	Portrait/Landscape	Selects the print orientation
Units		Inches/Millimeters	Millimeters	Selects the default unit of measurement in menus

3.4 USER MODE (CONT'D)

3.4.1 Setting the Pitch Offset

This setting adjusts where printing begins vertically, relative to the bottom edge (nearest the print head) of each label. The maximum value allowed is 3.75 mm.



Adjusting the **OFFSET** potentiometer adjusts the tear-off stop position for use with a cutter, peeler.

Finally, adjusting the Print Darkness potentiometer adjusts the print darkness.

When all the settings are satisfactory, press the **ENTER** button to proceed to set other parameters in the User Mode.

3.4.2 Setting Print Speed

This setting can be used to achieve a high print speed that does not compromise print quality. Press the **^** and **v** cursor keys to change the setting. Press the **ENTER** button to confirm a setting and proceed to the next screen.

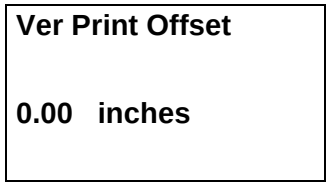
Print Speed
4 ips*

If quality printing cannot be obtained due to the quality of the paper or the printing contents, lower the speed accordingly.

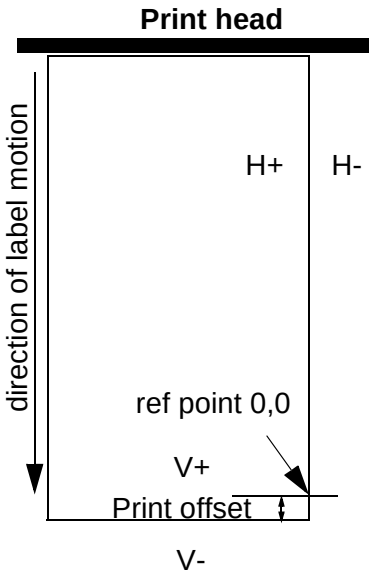
3.4 USER MODE (CONT'D)

3.4.3 Setting Ver/Hor Print Offsets

This setting allows you to set the Print Position Offset—which refers to the vertical and horizontal shifting of the entire print area, relative to the start position of printing (V=0, H=0), defined by default to be the bottom right hand corner of the label.



Use the **^** and **v** cursor keys to select the V or H Offset setting, and change the highlighted setting as necessary. Press the **ENTER** button to confirm a setting and proceed to the next screen.



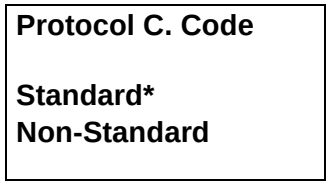
The V setting is for the Vertical print offset. A positive (+) offset means the printing is shifted towards the print head; a negative (-) offset means shifting away from the print head. If the Print Pitch setting has been used to offset the vertical start position, then all Vertical offset adjustments are made relative to that start position.

The H setting is for the Horizontal print offset. The + or - prefix determines whether the offset is to the left or to the right of the reference point.

Printer	Valid H and V settings (in dots)
GL408*e*	V: +/- 000 to 1424 dots, H: +/- 000 to 832 dots
GL412*e*	V: +/- 000 to 2136 dots, H: +/- 000 to 1248 dots

After setting the Vertical and Horizontal OFFSET, press ENTER to proceed to the next setting.

3.4.4 Specifying the Protocol Command Code



The ESC sequence in SBPL commands can be defined as standard (using non-printable code 1BH) or non-standard (some other user code).

Press the **^** and **v** cursor keys to select the STANDARD or NON-STANDARD option. The default setting is STANDARD.

Press the **ENTER** button to confirm the setting and proceed to the next screen.

3.4 USER MODE (CONT'D)

3.4.5 Specifying the Ver/Hor Base Reference Points

Ver BaseRefPoint
0 dots*

The Vertical or Horizontal Base Reference Point defines the origin 0,0 of a label (Reference Point).

Press the **^** and **v** cursor keys to change the value in Dots, to the desired quantity. The range of legal values that can be set here is dependent on the print head resolution of your GL printer, and the width of label used.

Press the **ENTER** button to confirm the setting and proceed to the next screen.

3.5 INTERFACE MODE

The following settings are available in Interface Mode:

DISPLAY	SUB-MENU	RANGE	DEFAULT	DESCRIPTION
Ignore CR/LF		No/Yes	No	
Item No. Check		Disable/Cancel/ Resume	Disable	Appears only if Comm. Protocol is set to Status 5
BCC Check		Disable/Cancel/ Resume	Disable	Appears only if Comm. Protocol is set to Status 5
History Buffer		Temporary/Permanent	Temporary	Appears only if Comm. Protocol is set to Status 5
Comm. Protocol		Standard/Status2/ Status3/Status4/ Status5	Status 5	
Status Reply		ENQ/Cycle	ENQ	Appears only if Comm. Protocol is set to Status 4
Host Interface		Auto Switching/ Centronics/ Serial/ IEEE 1284/USB	Auto Switching	
ETHERN. Port	Timeout	1-15 Secs.	Timeout	Appears only if LAN interface is selected
ETHERN. Address	IP Address xxx.xxx.xxx.xxx	Per TCP/IP standard valid address range	000.000.000.000	Appears only if LAN interface is selected
	Subnet Mask xxx.xxx.xxx.xxx	Per TCP/IP standard valid address range	000.000.000.000	Appears only if LAN interface is selected
	Gateway Address xxx.xxx.xxx.xxx	Per TCP/IP standard valid address range	000.000.000.000	Appears only if LAN interface is selected
	MAC Address xxx.xxx.xxx.xxx	Per TCP/IP standard valid address range	Read-only, uniquely assigned	Appears only if LAN interface is selected
	DHCP	Disable/Enable	Disable	Appears only if LAN interface is selected. Consult your administrator for the appropriate setting.
ETHERN. Setting	NetBIOS Protocol	Enable/Disable	Enable	Appears only if LAN interface is selected
	ASCII Data Prt	1025 to 65535	9100	Appears only if LAN interface is selected. Sets the port number for ASCII print jobs, and must match your host system setting.
	Keep Alive Timer	2 - 10 minutes	3 min	Appears only if LAN interface is selected. With the time on, the TCP connection will stay connected even after the print job has terminated.
	Ethernet Speed	Auto Select/10 Half or Full/100 Half or Full	Auto Select	Appears only if a 10/100-Base-T LAN card is installed

	Job Control	Off/Standard/ Enhanced	Standard	Appears only if LAN interface is selected. Standard: NIC waits for entire job to be received before indicating that a job is done. Enhanced: Waits for entire job to be printed before a similar indication.
	Offline Process	Disable/Enable	Disable	Appears only if LAN interface is selected
WLAN Address	IP Address xxx.xxx.xxx.xxx	Per TCP/IP standard valid address range	000.000.000.000	Appears only if WLAN interface is selected
	Subnet Mask xxx.xxx.xxx.xxx	Per TCP/IP standard valid address range	000.000.000.000	Appears only if WLAN interface is selected
	Gateway Address xxx.xxx.xxx.xxx	Per TCP/IP standard valid address range	000.000.000.000	Appears only if WLAN interface is selected
	MAC Address xxx.xxx.xxx.xxx	Per TCP/IP standard valid address range	Read-only, uniquely assigned	Appears only if WLAN interface is selected
	DHCP	Disable/Enable	Disable	Appears only if WLAN interface is selected. Consult your administrator for the appropriate setting.
WLAN Setting	Signal Strength	NA	NA, read-only	Appears only if WLAN interface is selected
	Operation Mode	Infrastructure/Pseudo IBSS/Ad Hoc	Infrastructure	Appears only if WLAN interface is selected. An Access Point is needed for Infrastructure Mode. Pseudo IBSS requires two peers specific to the same manufacturer, running standard Peer-to-Peer communication without an Access Point. Ad Hoc mode achieves standard Peer-to-Peer communication without an Access Point and the two peers can be from different manufacturers.
	SSID Name	1 to 32-character, case sensitive string including alphanumerics, symbols and spaces	NA	Appears only if WLAN interface is selected
	Reset SSID Name	NA	NA	Appears only if WLAN interface is selected
	Min.Xfer Rate	Auto-negotiate/1 Mb/ sec./2 Mb/sec./5.5 Mb/ sec./11 Mb/sec.	Auto-negotiate	Appears only if WLAN interface is selected
	Channel	Default/1-15	Default	Appears only if WLAN interface is selected. Selects the RF channel.
	Ant.Diversity	Diverse/Primary/Auxiliary	Diverse	Appears only if WLAN interface is selected. Select Primary or Secondary to use the relevant antenna on the server.
	Preamble	Default/Short/Long	Default	Appears only if WLAN interface is selected
	Power Mgmt	0 to 1000 ms	0 ms	Appears only if WLAN interface is selected. Sets the sleep time for power saving.

	Transmit Power	0 to 100%	100%	Appears only if WLAN interface is selected
	Internat.Mode	Disable/Enable	Disable	Appears only if WLAN interface is selected. When enabled, the printer adapts to international frequency requirements in Europe.
	Auth.Method	Open/Shared	Open	Appears only if WLAN interface is selected
	Default WEP Key			Appears only if WLAN interface is selected. You can set up to four encryption keys in ASCII of Hex, 40 or 128 bits.
	Reset WEP key	NA	NA	Appears only if WLAN interface is selected
	WEP key 1	Individual characters of encryption key	NA	Appears only if WLAN interface is selected
	WEP key 2	Individual characters of encryption key	NA	Appears only if WLAN interface is selected
	WEP key 3	Individual characters of encryption key	NA	Appears only if WLAN interface is selected
	WEP key 4	Individual characters of encryption key	NA	Appears only if WLAN interface is selected

***Parallel Port (This option only appears if this is the active port to be used)**	Port Type	IEEE 1284/Disable/ Centronics	IEEE 1284	
	Data Bit 8	Enable/Disable	Enable	The Enable option (factory default) means the PI line is not passed directly from host to printer; all 8 bits are used for data bits, and characters in the hex 80-FF range can be accessed. Disable means when the host PI line is enabled, data bit 8 internally indicates PI line status. To use the PI line, disable data bit 8, and enable the Host PI configuration option (under the PI Ignored option). Note: Data bit 8 is interpreted as either data bit 8 or PI signal, but never both. When enabled as data bit 8, data bit 8 has priority over the PI signal, and all data above hex 7F is used to access character data and not to interpret PI line data. Conversely, when data bit 8 is disabled and the PI signal is used, data bit 8 of the data is reserved for use as the PI function, and you cannot access characters in the hex 80-FF range. Therefore, to access characters in the hex 80-FF range, data bit 8 must be enabled.
	PI Ignored	Enable/Disable	Enable	The PI (Paper Instruction) signal is used to control vertical paper motion. The Enable option (factory default) ignores the PI signal and treats the data as characters or control codes. The Disable option causes the printer to interpret the eight data lines as VFU commands when the PI signal is true.
	Buffer Size in K	1 to 16	16	Configures the amount of memory allocated for the Ethernet buffer. The range is 1-16 KB, in 1-KB increments.
	Auto Trickle	Disable/Enable	Disable	This feature is used to prevent a host computer from “timing out” because the parallel interface is “busy” for too long. The Enable (factory default) option means, when the printer’s buffers are almost full, the printer begins to trickle data in from the host (at the rate set in the Trickle Time menu) until the buffers start to empty out.

	Trickle Time	1/4,1/2, 1,2,4,8,16,Off When the printer is printing data from a host and a second print job is received by the printer from a different host, Trickle Time prevents the second host from timing out while it is waiting for its data to be printed. In order to support this feature, the port has to be able to accept data from the host and store it for future use.	1/4 sec	E.g., if the printer is printing a job from the serial port, and then receives a second print job from the parallel port, the data from the parallel port will "trickle" bit by bit into the printer buffer to prevent a timeout error from being sent back to the host connected to the parallel port. The selected value is the time that the printer waits before getting the next byte of data from the host. The Trickle Time value should be less than the host time out value, but not too much shorter or else the printer fills up its buffer too fast. This function is not applicable for C/T hotport.
	Timeout	1 to 60	10 sec	This is the value used by the printer to time out from the current port and check the other selected port types for data to print.
	Report Status	Disable/Enable	Disable	When a fault occurs on the printer, only the active port reports the fault to the host. When enabled, this option sets the port to report any fault even when it is not the current active port.
	Prime Signal	Disable/Enable	Disable	Disable (factory default): The parallel port will not perform a warm start (reboot) if the host asserts the Prime Signal. Enable: The parallel port will perform a warm start (reboot) if the host asserts the Prime Signal.
	Data Polarity	Standard/Inverted	Standard	The Data Polarity parameter must be set to match the data polarity of your host computer. Standard (factory default): Does not expect the host computer to invert the data. Inverted: Expects the data received on the data lines from the host computer to be inverted. Ones become zeros and vice versa.
	Resp.Polarity	Standard/Inverted	Standard	The Response Polarity parameter must be set to match the response polarity of your host computer. The Standard (factory default) option does not invert the response signal. The Inverted option inverts the response signal sent to the host computer.
	Busy on Strobe	Enable/Disable	Enable	Enable (factory default): asserts a busy signal after each character is received. Disable: asserts a busy signal only when the print buffers are full.
	Latch Data On	Leading/Trailing	Leading	Specifies whether the data is read on the leading or trailing edge of the data strobe signal.
	Offline Process	Disable/Enable	Disable	When set to disable, the printer does not process parallel/network data while offline. Or else the printer continues to process (but not print) the current network/parallel job while the printer is offline until the printer's buffer is full.

***USB Port (This option only appears if this is the active port to be used)**	Buffer Size in K	1 to 16	16	This option configures the amount of memory allocated for the serial port buffer. The range is 1-16 KB, in 1-KB increments. NOTE: If you select a baud rate that is 19200 or greater, you may need to increase the Buffer Size in K parameter from the default to 16 KB to improve performance.
	Timeout	10 sec	1 to 60	This item allows you to set the time that the printer, when it has not received data from its host, will begin to service all other host ports looking for data to print.
***Serial Port (This option only appears if this is the active port to be used)**	Baud Rate	600,1200,2400,4800,9600,19200,38400,57600,115200	19200 BAUD	The Baud Rate, Word Length, Stop Bits and Parity settings must match those that are set on the host computer.
	Word Length	7,8	8	
	Stop Bits	1,2	1	
	Parity	None/Odd	None	
	Data Protocol	XON/XOFF,ETX/ ACK/ ACK/NAC/ Series1 1 Char/ Series1 2 Char/ DTR	XON/XOFF	XON / XOFF (factory default). The printer controls the flow of communication from the host by turning the transmission on and off. In some situations, such as when the buffer is full or the timing of signals is too slow or too fast, the printer will tell the host to stop transmission by sending an XOFF character. An XOFF character is sent when the number of empty bytes in the buffer is less than or equal to 25 percent of the buffer size. If the host keeps sending data after an XOFF is sent, the printer firmware will continue to send an XOFF for every 16 characters received. When cleared, the printer will resume receiving data (XON). The data does not have any End of Text codes; XON / XOFF is a non-block protocol. ETX / ACK. End of Text / Acknowledge. The host controls the flow of communication to the printer by sending a block of data and ending the block with an End of Text (ETX) signal. When the printer receives the ETX signal, it will acknowledge the ETX , thereby acknowledging it has received the entire block of data. ACK / NAK. ACK means acknowledge; the device acknowledges it has accepted a transmission. NAK means negative acknowledge; the device did not receive the transmission.
	Buffer Size in K	1 to 16	16	This option configures the amount of memory allocated for the serial port buffer. The range is 1-16 KB, in 1-KB increments.

	Trickle Time	1/4,1/2, 1,2,4,8,16,Off	1/4 sec	When the printer is printing data from a host and a second job is received by the printer from a different host, Trickle Time prevents the second host from timing out while it is waiting for its data to be printed. In order to support this feature, the port has to be able to accept data from the host and store it for future use. For example, if the printer is printing a job from the serial port and then receives a second print job from the parallel port, the data from the parallel port will "trickle" bit by bit into the printer buffer to prevent a timeout error from being sent back to the host connected to the parallel port. The selected value is the time that the printer waits before getting the next byte of data from the host. The Trickle Time value should be less than the host time out value, but not too much shorter or else the printer fills up its buffer too fast. This function is not applicable for C/T hotport.
	Timeout	1 to 60	10 sec	This is the value used by the printer to time out from the current port and check the other selected Port Types for data to print. When the printer has not received data from the host after a certain period of time, it needs to time out in order to service the other ports.
	Data term Ready	True/On-Line and BNF/Off-Line or BF/ On-Line/False	TRUE	Data Terminal Ready. This configuration is part of hardware flow control and determines when the Data Terminal Ready (DTR) signal is generated. This signal indicates if the printer is ready to receive data. • False. Never asserts the DTR signal. • True (factory default). Continuously asserts the DTR signal. • On-Line and BNF (buffer not full). Asserts the DTR signal when the printer is online and the internal serial buffer is not full. • Off-Line or BF (buffer full). Asserts the DTR signal when the printer is offline or the internal serial buffer is full. • On-Line. Asserts the DTR signal when the printer is online.
	Request to Send	True/On-Line and BNF/Off-Line or BF/ On-Line/False	On-Line and BNF	This configuration is part of hardware flow control and determines when the Request to Send (RTS) signal is generated. This signal indicates whether or not the printer is ready to receive data. • False. Never asserts the RTS signal. • True. Continuously asserts the RTS signal. • On-Line and BNF (factory default). Asserts the RTS signal when the printer is online and the internal serial buffer is not full. • Off-Line or BF. Asserts the RTS signal when the printer is offline or the internal serial buffer is full. • On-Line. Asserts the RTS signal when the printer is online.

	Poll Character	00 to FF	00 Hex	This option is for the Series1 protocol. Whenever the printer receives this character, it sends a response to the host indicating the current state of the printer (see Series1 protocol).
	Poll Response	0 to 30	0 ms	This option is for the Series1 protocol. After receiving a poll character, the printer will wait the poll response time in milliseconds before sending the response.
	Idle Response	Disable/Enable	Disable	This option is for the Series1 protocol. • Disable (factory default). • Enable. The printer sends a response character every two seconds while the number of valid bytes in the buffer is less than 75 percent of the buffer size.
	One Char Enquiry	Disable/Enable	Disable	The One Char Enquiry mode uses the Poll Character to detect a request from the host and sends a response back to the host. . Printer State — Response (hex) Online and Buffer Not Full — 22 Online and Buffer Full — 23 Offline and Buffer Not Full — 20 Offline and Buffer Full — 21
	Printer Status	Disable, ENQ/STX, ENQ	Disable	Disable. Printer status ignored. ENQ/STX: Bit — Printer Status 0 — Set when the printer is not online or the buffer is full 1 — Set when the printer is offline. 2 — Clear during a paper out or RibbonMinder fault 3 — Always set 4 — Set during a Head Open fault. 5 — Set during a buffer overflow fault 6 — Set during a parity or framing error fault 7 — Always clear ENQ: Bit — Printer Status 0 — Set when the label has printed 1 — Set when the label is presented 2 — Set while the printer is online 3 — Always set 4 — Set printing in the batch mode 5 — Set during a Ribbon fault 6 — Set during a Paper Out fault 7 — Set during a Head Open fault
	Framing Errors	Enable/Disable	Enable	These are possible errors that can occur when serial interface settings of the printer do not match those of the host computer. If enabled (factory default), a framing error causes a fault message to display on the control panel. If disabled no fault message will be displayed.

3.6 ADVANCED MODE

Advanced Mode lets you configure the more advanced features of the printer hardware. The following settings are available in Advanced Mode: (Menus marked with an asterisk * in front are only available in Admin User has been enabled in this menu.

DISPLAY	SUB-MENU	RANGE	DEFAULT	DESCRIPTION
Media Handling		Continuous/Tear-Off/Dispenser/Cutter/Rewind	Continuous	
***Adv Continuous**		Standard/Tear-Off/ Tear Strip Full	Standard	
Print Mode		Transfer/Direct	Transfer	
Gap/Mark Sensor		Gap/Disable/Mark	Gap The Gap option is for use with media featuring a liner space between die-cut labels or when using tag stock with notches or holes as label length indicators on white background media. The Top-of-Form position is the leading edge of the die cut label (trailing edge of the gap, notch, or hole).	Select when using media that has horizontal black marks located on the underside of the label liner or tag stock. The Top-of-Form position is the leading edge of the black mark. Note: When you select Disable, the length of each label is based on the Label Length value entered in the MEDIA SETUP menu or the value sent via host software.
Run Auto Cal Notes: Supports label lengths up to 24 inches. Changes in values take effect immediately within the current configuration menu.		-1.00 to 12.80 (-25.4 to 152.0 mm)	0.00 inches Note: Run Auto-Cal is completed successfully when the Sensed Distance displayed correctly matches that of the installed media. When Gap is selected, the Sensed Distance should match the length from the trailing edge of one gap to the trailing edge of the next gap (one label + one gap). When Mark is selected, the Sensed Distance should match the length from the leading edge of one black mark to the leading edge of the next black mark.	This feature is used to improve the sensitivity and reliability of the Media Sensor in detecting gaps, notches, holes, or black marks on the installed media, as well as a paper out condition. Press the ENTER key with "Run Auto-Cal" displayed. The printer will then advance media the distance needed to accurately detect the label length indicators, then stop at the Top-of-Form position and momentarily display the Sensed Distance. The end result will be a change to the Gap/Mark Threshold, Paper Out Threshold, and Sensed Distance values that the printer will use.
Run Profile		-1.00 to 1.00 (-25.4 to 25.4 mm)	0.00 inches	
***Power Saver Time**		1,5,10,15,30,45,60, 240	15 minutes (Note: Pressing any key removes the power saver message from the control panel. Sending a print job to the printer also turns off power saver mode.)	The time interval you specify for this parameter sets the amount of idle time before the printer goes into Power Saver mode.

***Pwr Save Control**		Enable/Disable	Enable	Allows you to enable and disable Power Saver mode. If enabled, the menu for Power Saver Time is in effect.
Display Language		English/German/ French/ Italian/ Spanish/Portuguese	English	Sets the language used for all LCD text communication.
***Alarm**		On/Cont.Beep/Off	On An audible alarm sounds (3 beeps) by default when a fault occurs, such as a paper jam.	
***Date**			00:00 2005Jan01	This menu allows you to set the date and time. The date is expressed in hh:mm YYYYMMMDD. MMM = month DD = day YYYY = year hh = hour mm = minute
Auto Online		Enable/Disable	Enable	Sets the printer to go to ONLINE mode upon startup or error being cleared
***Cancel Key**		Enable/Disable	Enable	When enabled, the key may be used in offline mode to clear all data in the print buffer, and deleted data will not be printed.
***Ret.Status Port**		Serial/E-NET Stat Port/ USB/IEEE1284/Disable	Serial	This option selects the port for the Return Status Commands (i.e., ~STATUS (PGL) and ~HS (PPI/ZGL)) to send the status data back to the Host.
***Del Char frm Fls**				Delete Character from Flash
***Ld Char From Fls**				Load Character from Flash
***Save Char to Fls**				Save character to Flash
***Del Char Frm RAM**				Delete Character from RAM
***LD Char at Pwrup**		Disable/Enable	Disable	Load Character at Power Up
***Del Set Frm Flash**				Delete Set from Flash
***Ld Set From Flsh**				Load Set from Flash
***Save Set to Flsh**				Save Set to Flash
***Del Set From RAM**				Delete Set from RAM
***Ld Set at PwrUp**		Disable/Enable	Disable	Load Set at Power Up
***Main FFS**	Overwrite Files View Main Files Delete Files Flash Avail.0 Bytes	Enable/Disable	Enable	Overwrite Files (factory default): prevents files from being overwritten View Main Files: Displays the list of files in the main file system. Pressing the v cursor key displays the file size. Delete Files: lets you delete files in the main file list. Ask your administrator for help. Flash Avail: The amount of flash available for the user to save or download files into the main flash area.

***Optimize&Reboot**				Reclaims flash space from deleted flash files. After pressing ENTER, wait for the printer to reboot. NOTE: The Optimize feature will optimize both the Main and Extd file system (if present).
Print File List		Disable/Enable	Enable	Prints a summary of the files stored in flash memory and several statistics on File System usage.
***Auto Locking**		Disable/Enable	Disable	Disable (factory default): The ENTER button must be locked manually. Enable: The printer automatically locks the ENTER button five minutes after the last control panel was used.
***Set Lock Key** (This lets you choose different buttons for locking or unlocking the printer menu.)			The default lock keys and the ENTER and **v** (down cursor) keys.	Choose any group of keys as the new lock and unlock keys that are not already used for another function. To set the new lock key: At the °Select a new lock key" prompt, press the combination of keys that you want to assign as the new lock key. Make sure you press all keys selected at the same time. If the selection is valid, the display will read, ¡°Enter the new lock key again." If set correctly, the message °Lock key has been changed." appears.
***Max Font Buffer**		100 to 1800	100 KB	The maximum amount of DRAM allocated for downloading fonts (True-Type, Scalable, or Bit Map).

***Max Cache Memory** (NOTE: HS = Horizontal resolution VS = Vertical resolution Average Height = Average character height (inches) Average Width = Average character width (inches NumOfChar = Number of Characters to be cached)		50 to 2000	900 Kbytes	The Maximum Cache Memory option specifies the size of the memory block that can be allocated to the font cache. The font cache stores bitmaps that are created on demand from the font outlines stored on the printer flash. The cache allows the printer to print scalable fonts at optimum speed. To calculate the memory requirement, use this equation: (HS x VS x Average Height x Average Width x NumOf Char)/ 8
***Max Cached Char** (NOTE: HS = Horizontal resolution VS = Vertical resolution Average Height = Average character height (inches) Average Width = Average character width (inches NumOfChar = Number of Characters to be cached)		01 to 20	01 Kbytes	Specifies the size of the largest character that can be stored in the font cache. To calculate the memory requirement, use this equation: (HS x VS x Average Height x Average Width)/
***Standard Chars**		0 to 512	340	This menu entry permits you to adjust the thickness or font weight of standard text fonts.
***Bold Chars**		0 to 512	448	This entry permits you to adjust the thickness or font weight of bold text fonts. This menu will not take effect unless you save it in a configuration and the printer is powered up with that configuration.
***Extra Bold Char**		0 to 512	504	This menu entry permits you to adjust the thickness or font weight of extra bold text fonts.
***OCR-A Chars**		0 to 512	384	Character weight adjustment of resident OCR-A characters.
***OCR-B Chars**		0 to 512	304	Character weight adjustment of resident OCR-B characters.
***Tall Charcters**		Disable/Enable	Disable	Increases the height of resident scalable characters. Enabling the feature increases the height by approximately 10 percent.

***Batch Counter**		Disable/Enable Enable (factory default): The # Pages remaining to be printed will display on the second line of the control panel LCD. This feature is supported in PGL and ZGL only. The PGL Execute command to support this feature is ~EXECUTE;NAME;(#Pages). The ZGL Execute command is ^PQ(#Pages).	Disable Disable: The # Pages remaining to be printed will not display. Instead, the Active emulation and interface will display on the second line of the control panel LCD.	Displays the number of pages remaining in a print job. NOTE: If the correct execute command is absent from the print file, “0 Pages” will continually display on the control panel LCD.
Disp. Intensity		0 to 20	10	Sets the Display Intensity values from 0 to 20.
***SENSOR SETUP**	Sensed Distance Gap/Mark Thresh Run Manual Cal Pwr Up Auto-Cal Head Auto-Cal Online Auto-Cal Gap Windowing Gap Length Cal in Peel Mode Min Calib Delta Use Label Length Threshold Range	1 to 9.9 (0.1 to 251.5 mm) 0 to 255 Enable/Disable Enable/Disable Disable/Enable Disable/Enable 0.05 to 1.00 (2 to 25 mm) Disable/Enable 012 to 050 Disable/Enable 5 to 95%	0 inches (00.0 mm) 140 Enable Enable Disable Disable 0.12 inches (3 mm) Disable 20 Disable 50%	
Admin User		Disable/Enable	Disable	When enabled, this function permits access to submenu items not normally accessible to a typical user.

3.7 DIAGNOSTICS MODE

The following settings are available in Diagnostics Mode:

DISPLAY	SUB-MENU	RANGE	DEFAULT	DESCRIPTION
Priority Setting		LCD (Internal)	Command	Selects whether software commands can override printer settings, or whether settings via the LCD have priority.
Printer Tests		Checkerboard Grey Grid Current Config Left Test Right Test Combo Test Ethernet Test Barcode Demo RFID Report	Checkerboard	Checkerboard: This pattern helps identify marginal print head elements, quality of edge sharpness, and uneven print quality. Grey: This pattern helps identify burned out print head elements and uneven print quality. Grid: This pattern helps identify edge sharpness and uneven print quality. Current Config: Prints the current printer configuration and helps identify the text print quality. Also prints Print head statistics in the header. Left Test: Prints a pattern containing a series of ladder-type bar code symbols, starting with four and decrementing by one symbol on each print until a single symbol prints on the left side. This pattern helps identify ribbon wrinkle problems. Right Test: Prints a pattern containing a series of ladder-type bar code symbols, starting with four and decrementing by one symbol on each print until a single symbol prints on the right side. This pattern helps identify ribbon wrinkle problems. Combo Test: Prints a combined left test and right test. Ethernet Test. This item appears only if the Network Interface Card (NIC) adapter is installed. Prints the NIC statistics stored on the NIC adapter. Barcode Demo: Prints text and barcodes with the barcodes positioned at the left and right margins of the standard label media supplied with the printer. The test automatically produces output for 4 inch printers at 203dpi and 305 dpi. RFID Report: This item appears only if the RFID encoder is installed. Prints a report of RFID statistics since the printer was turned on or since the last data reset. Once you have selected the desired test pattern, press ENTER to start printing. If the Test Count option (below) is set to Continuous (factory default), press ENTER again to stop printing.

Software Build		NA		This is the reference number which includes the program file part number and revision number of the software installed in the printer, e.g., 358186 V1.07G.
Hex Dump Mode		Enable/Disable	Disable	If enabled, this option prints out data sent from the host in hexadecimal format.
FLASH Installed		NA		Displays the amount of FLASH memory installed in megabytes.
DRAM Installed		NA		Displays the amount of DRAM installed in megabytes.
Printer Usage		NA		Displays the length of media actually printed since the last Reset Head Data operation. This value is set to zero at the factory after burn-in testing.
PrintHead Usage		NA		Displays the length of media actually printed since the last Reset Head Data operation. This value is set to zero at the factory after burn-in testing.
Head Type		NA		Displays the print head resolution available, in Dots Per Inch.
Head Voltage		NA		Displays the print head voltage being applied

3.8 CONFIGURATIONS MODE

The following settings are available in Configurations Mode:

DISPLAY	SUB-MENU	RANGE	DEFAULT	DESCRIPTION
Save Config.		1-8	1	This option allows you to save up to eight unique configurations to meet different print job requirements. This eliminates the need to change the parameter settings for each new job. The configurations are stored in memory and will not be lost if you turn off the printer. If the Protect Configs. parameter is enabled, the new configuration will not be saved unless the existing configuration has been deleted first. The factory default configuration cannot be changed.
Print Config.		1-8	Current config.	Prints out the current configuration settings that are in force
Delete Config.		1-8	1	Deletes the specified user configuration

3.9 EMULATIONS SETUP MODE

The following settings are available in Emulations Setup:

DISPLAY	SUB-MENU	RANGE	DEFAULT	DESCRIPTION
Select	SBPL		SBPL	Selects SATO Barcode Programming Language as the standard language for host commands.
	DGL			Selects Datamax Printer Language as the standard language for host commands.
	PGL			Selects Printronix Printer Language as the standard language for host commands.
	ZGL			Selects Zebra Printer Language as the standard language for host commands.
	TGL			Selects TEC Printer Language as the standard language for host commands.
	IGL			Selects Intermec Printer Language as the standard language for host commands.

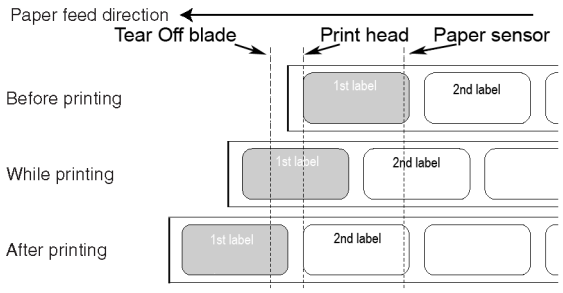
3.10 UNDERSTANDING CONTINUOUS PRINT AND TEAR OFF OPERATIONS

The Continuous Print and Tear Off operations are available for use if the printer is not connected to a cutter or peeler. The difference between the two operations is in the way the label paper is ejected. Here are the details:

Continuous Print Operation

In this method of operation, whenever a print job has been completed (or when a sheet of paper is fed) the paper is ejected outwards until the second label from the front is placed just in front of the print head. The first label will not be completely ejected, and cannot be torn off neatly.

Continuous Print Operation

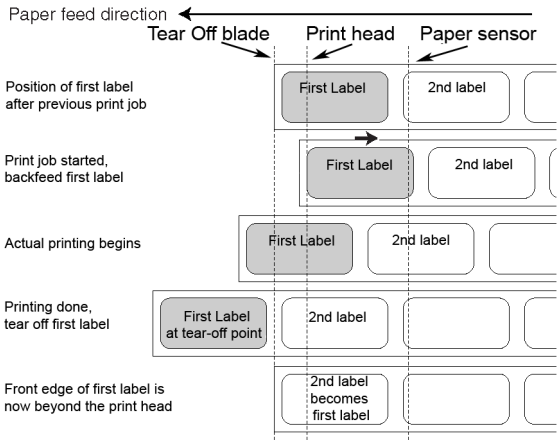


Tear Off Operation

In this method of operation, after printing, the printer feeds the first (outermost) label so that its bottom edge rests at the position of the cutter blade. This label can then be torn off easily.*

However, when the front label is torn off, the label behind it would now have its front edge moved beyond the print head position. Since printing has to begin from the top of a label, the printer therefore performs a backfeed to the front-most label before printing resumes, so that the first labels' top edge is repositioned behind the print head. Printing can then proceed normally.

Tear Off Operation



*assuming that this tear-off position has been properly calibrated as discussed in the User Mode **Section 3.4.2 Setting Print Speed.**

4

CLEANING AND MAINTENANCE

4.1 INTRODUCTION

This section provides information on user maintenance for the GL Series printers. The following information is covered here:

- Cleaning the Print Head, Platen and Rollers
- Adjusting print quality

4.2 CLEANING THE PRINT HEAD, PLATEN AND ROLLERS

The print head not only generates printouts of barcodes, but also graphics and text. To produce optimal printing, it must be kept clean in spite of the dirt and adhesive that constantly accumulates on its print surface. Furthermore, dirt can accumulated along the label path, affecting parts like sensors and guides, and reducing their performance.

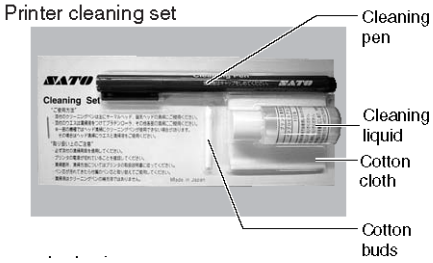
Therefore, it is important to clean these important components periodically. Depending on the region in which the GL4xxe series printer was bought, a cleaning set and/or a set of cleaning sheets may be provided with the unit. If any of the cleaning items need replacement, contact your authorized SATO dealer.

When to clean with the cleaning set (if supplied)

- Printer head, platen roller, paper sensor, and label guide: clean after using up every other roll of paper, or each time after printing 150 m.
- Other parts: clean after finishing every six rolls of paper, or every time after printing 900 m.

When to clean with the supplied cleaning sheet

- Printer head, platen roller: clean after using every six rolls of paper, or every time after printing 900 m.



Sample cleaning kit that may be supplied with your printer or purchased separately

4.2.1 DETERMINING WHEN THE PRINT HEAD NEEDS REPLACEMENT

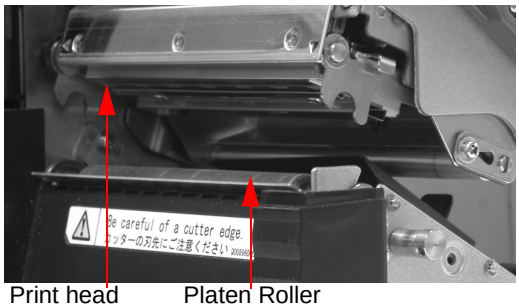
- Check for vertical streaking in the same location of every label. If cleaning the print head does not cause the streaking to be eradicated, then the printhead may be worn. Remove the printhead and examine it for physical damage or wear.

- Load a different roll of labels and ribbon, and then run test prints again. If the vertical streaks continue to surface, then the printhead needs to be replaced. See Page “2.4 Replacing the Print Head” on page 2-18.

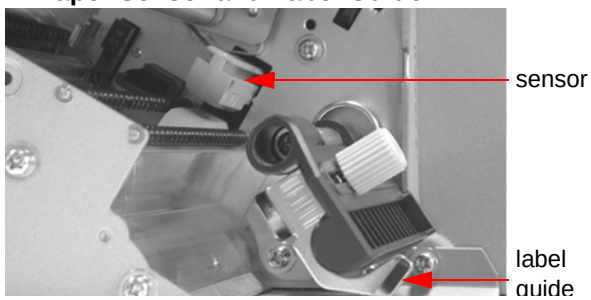
4.3 HOW TO CLEAN THE PRINTER (CLEANING SET)

If you are using a carbon ribbon, be sure to remove it before cleaning. Follow the instructions supplied with the cleaning set. Use the items to clean the following parts.

Print head

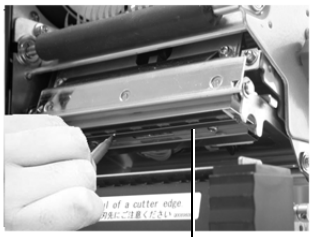


Paper Sensor and Label Guide



1. Lift up the main cover.
2. Unlatch the print head unit using the head release lever. The print head is now accessible.
3. Wipe off the dirt from the printer head and paper sensor using a cleaning pen. (See figure on the right)

Cleaning the Print Head



4. Moisten the cotton cloth with cleaning liquid, and use the cloth to wipe any dirt or accumulated adhesive off the platen roller. (See figure on the right)
5. If you are using linerless labels, also wipe off the dirt on the fixed cutter blade with a cleaning pen.

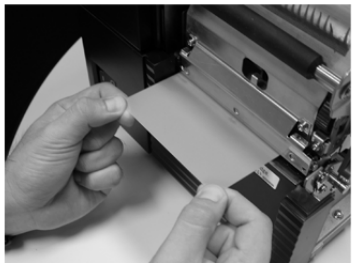
Cleaning the Platen Roller

4.4 HOW TO CLEAN THE PRINTER (CLEANING SHEET)

The cleaning sheet is used for cleaning the print head and platen roller.

1. Lift up the main cover.
2. Unlatch the print head unit using the head release lever.
   The print head is now accessible.
3. Remove the label and the ribbon.
4. Put the head cleaning sheet between the print head and the platen roller. The coarse side of the cleaning sheet should face the surface of the print head elements.
5. Fasten the head-release lever to mount the print head.
6. Using both hands, pull the cleaning sheet outwards, toward your body. This will remove any dirt stuck to the print head.
7. When the cleaning sheet has been removed, perform steps 2 to 6 to repeat the cleaning procedure one or two more times.
8. When no more additional dirt appears on the cleaning sheet after it has been pulled out, you can stop cleaning with the sheet.
9. Unlatch the print head and use the cleaning pen from the cleaning kit to gently remove any remaining dirt from the print head.

Using the Cleaning Sheet



⚠ Caution

- Be sure to turn off the power before cleaning.
- The suggested cleaning schedule here are just guidelines. If necessary, clean as appropriate depending on the degree of contamination.
- Use a cleaning pen or cotton cloth to clean the printer units.
- Use only soft, lint-free materials for cleaning. Avoid using hard objects for the cleaning process, as they will damage the components.

4.5 ADJUSTING PRINT QUALITY

Print quality can be optimized with regular cleaning and maintenance of the print head and components along the label path. Additionally, you can fine-tune print quality by adjusting print darkness and print speed settings.

4.5.1 Adjusting Print Darkness

This adjustment allows the user to control (within a specified range) the amount of power applied to the individual print head heat elements. It is important to find a proper print darkness level based on your particular label and ribbon combination. The printed images should not be too light nor should the ink from the ribbon "bleed." The edges of each image should be crisp and well defined.

LCD Panel — The Print Darkness can be set using the front panel LCD panel (User Mode) or by sending the Print Darkness software command from a computer.

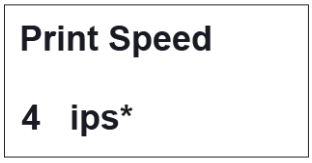
There are five settings, from -15 (lightest) to +15 (darkest). The default setting is 5. Use the Up and Down cursor buttons to adjust the cyclical value displayed on the screen.

For instructions on setting Print Darkness, refer to Section 3, Configuration.

4.5.2 Adjusting Print Speed

Besides varying the rate at which labels are printed, this adjustment can be used to regulate any changes in print quality.

LCD Panel — Print Speed can be set using the front panel LCD panel (User Mode) or by sending the Print Speed software command from a computer.



On the GL408*e* and GL412*e*, there are nine settings, from 2 ip/s (slowest) to 10 ip/s (fastest). The default setting is 4.

For instructions on setting Print Speed, refer to page 3-5, Operation and Configuration.

5

TROUBLESHOOTING

Observations

If you are unable to produce printouts on the GL Series printers, use this section to make sure the basics have been checked, before deciding you are unable to proceed any further. The section is divided into seven parts:

- Initial Checklist
- Checklist for the Centronics Parallel Interface
- Checklist for the RS232C Serial Interface
- Understanding STATUS, RIBBON and LABEL indicators
- Understanding the LCD error messages
- Understanding the LCD warning messages
- General Troubleshooting Guide

5.1 INITIAL CHECKLIST

1. Is the printer powered up and ON LINE?
2. Is the ERROR light on the front panel OFF? If this light is ON, it may mean the print head assembly is open or another error condition is present.
3. Are the Label Hold-Down and Print Head Assembly in the latched position?

5.2 USING THE CENTRONICS (PARALLEL) INTERFACE

1. Is the IBM parallel printer cable connected securely to your parallel port (DB-25S Female) on the PC and to the Centronics connector on the printer?
2. Is there more than one parallel interface port on your PC (LPT1, LPT2, etc.)? If so, make sure you are sending data out the correct port.
3. When you send the print job to the printer, and it does not respond, do you get an error message on your PC that says “Device Fault” or something similar?
   This may mean that the computer doesn’t know the printer is there. Verify that:
   a. Both ends of the cable are securely inserted into their respective connectors.
   b The printer is ONLINE.
   c. The cable is not defective. There are other things that can cause this error message on your computer, but at this stage, a defective cable may be one of the reasons.

5.2 USING THE CENTRONICS (PARALLEL) INTERFACE (CONT'D)

Observations

4. When you send the print job to the printer and it does not respond, and there is no error message on the PC:

   A. Check your data stream for some of the basics. Is your job framed as follows? For SBPL:
      <ESC>A—DATA—<ESC>Z

   B. Verify that you've included all required parameters in the data stream.

   C. Verify the following:
      - You have not typed a "0" (zero) for an "O" (letter) or vice-versa.
      - You have not missed any <ESC> characters where they're needed.
      - Make sure all printer command codes are capital letters.
      - Your protocol codes are set for Standard or Non-Standard and your data stream is consistent with these.

5. If you've checked all of the above and the printer still isn't printing, you may want to try a Receive Buffer Hex Dump to determine what (if anything) the printer is receiving from your computer. To print Hex Dumps see page 3-21, Configuration and Operation.

   The Centronics port is now listening for incoming data. Send your print job. The printer will now print (only once) a Hexadecimal (Hex) Dump of everything it received from the host computer. Each 2-digit hexadecimal character represents a character the printer received. It may be tedious, but now you can analyze and troubleshoot the data stream.

6. While checking the Hex Dump printout, look out for the sequence 0D 0A, which is a combination of Carriage Return and Line Feed characters. The command string should be continuous, and you should not see CR or LF characters between the Start Command (**<ESC>A**) and the Stop Command (**<ESC>Z**) for SBPL emulation.

   If you are using BASIC, it may be adding these characters automatically as the line wraps. Adding a "width" statement to your program can help to suppress these extra 0D 0A characters by expanding the line length up to 255 characters. See the beginning of the Programming Reference, under Command Codes, for details on writing a program in BASIC.

   If you are not programming in BASIC, check to see if you have an equivalent statement in the language you're using, to suppress extra carriage returns and line feeds from your data being sent out to the printer. The data stream should be one complete line going to the printer.

5.3 USING THE RS232C (SERIAL) INTERFACE

Observations

1. Is the RS232C Serial cable connected securely to your serial port on the PC (Male connector) and to the RS232C connector on the printer?

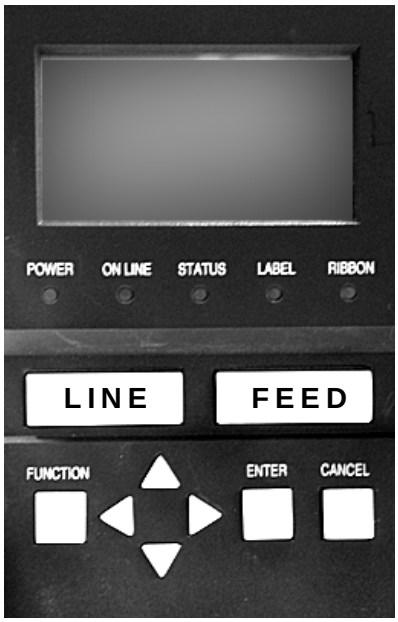
2. Is the cable defective? At the very least, you should be using a “Null Modem Cable,” which crosses pins in a specific manner. This should enable your printer to print.

3. Check for obvious errors in the data stream. Remember that all print jobs for serial data must be framed by an **STX** and **ETX**.

4. If after sending your job to the printer, it only “beeps” indicating a “framing error” message, you may have a configuration problem. There may be some inconsistencies with the Baud Rate, Parity, Data Bits, or Stop Bits in relation to your host computer. If you are confused as to what the printer’s current RS232 settings are, you may choose the SATO defaults (all DIP switches in the OFF position) to achieve 9600 baud, no parity, 8 data bits, and 1 stop bit.

5.4 UNDERSTANDING THE STATUS INDICATORS

The LED indicators flash to indicate the current status of the printer. Another indicator is the built-in buzzer which sounds audible beeps to alert the user.

Indicator	Activity	Cause	Remedy	Illustration
STATUS	**Flashes (green)**	**The receive buffer is getting low, due to abundant incoming data.**	**You can continue using the printer.** **The flashing should stop as soon as the receive buffer clears more of the incoming data**	 Five LED indicators are employed to indicate the operational status of the printer. Additionally, a built-in speaker generates audible tones to alert the operator.
RIBBON	**Flashes (red)**	**The ribbon reel is running low on ribbon.**	**You can continue using the printer.** **Replace the ribbon if the Ribbon End error message appears during printing.**	
LABEL	**Flashes (red)**	**The label reel is running low on label.**	**You can continue using the printer.** **Replace the label reel if the Label End error message appears during printing.**	
BUZZER	**Beeps**	**There is an error in an incoming printer command or print area specification setting.**	**Correct the printer command or print area settings.**	

For information on error messages and icons, proceed to the next section.

5.5 UNDERSTANDING THE LCD ERROR MESSAGES

LCD Message	Description	
B10 ERROR: **NO DRAM DETECTED** **Cycle Power**	**Cause:** **Remedy:**	**DRAM is faulty or otherwise not detected by the system** **Turn the printer OFF for 15 seconds, then ON again. If the problem persists, contact your authorized customer service representative.**
B11 ERROR: **RAM TEST FAILED** **Cycle Power**	**Cause:** **Remedy:**	**One or more memory locations failed the RAM test.** **Turn the printer OFF for 15 seconds, then ON again. If the problem persists, contact your authorized customer service representative.**
B12 ERROR: **PROGRAM MISSING** **Repeat Download**	**Cause:** **Remedy:**	**The data controller program of the printer was not found, or has been corrupted.** **Turn the printer OFF for 15 seconds, then ON again. If the problem persists, contact your authorized customer service representative.**
B22 ERROR: **DECOMPRESS SIZE** **Repeat Download**	**Cause:** **Remedy:**	**Downloaded data was decompressed but found to have a different filesize than expected.** **Turn the printer OFF for 15 seconds, then ON again. If the problem persists, repeat the data download.**
B23 ERROR: **DECOMPRESS CKSUM** **Repeat Download**	**Cause:** **Remedy:**	**Downloaded data was decompressed but found to have a different checksum than expected.** **Turn the printer OFF for 15 seconds, then ON again. If the problem persists, repeat the data download.**
CALIBRATION FAIL **See User Manual**	**Cause:** **Remedy:**	**Preset printer setting installed by the Manual Calibrate function were not acceptable.** **Run the Manual Calibrate function again.**
DOWNLOADER ERROR **BEYOND __ MB EFC** **Repeat Download**	**Cause:** **Remedy:**	**An attempt to access the printer firmware beyond the allowed area.** **Contact your SATO technical service centre for corrective action.**
DOWNLOADER ERROR **EXTERNAL FLASH IS FULL** **Optimize Files**	**Cause:** **Remedy:**	**Insufficient memory remaining for the download.** **Delete and optimize files.**
DOWNLOADER ERROR **EXTERNAL FLASH WAS** **NOT FOUND** **Insert Cartridge**	**Cause:** **Remedy:**	**No cartridge-based memory area was found to store the data to be downloaded.** **Make sure a properly working memory cartridge has been installed, or specify another storage area.**
DOWNLOADER ERROR **FLASH NOT ERASED** **Repeat Download**	**Cause:** **Remedy:**	**An error occurred when the flash memory was being reprogrammed.** **Turn the printer OFF for 15 seconds, then ON again. If the problem persists, contact your authorized customer service representative.**

LCD Message	Description	
DOWNLOADER ERROR **FLASH WRITE #__** **Repeat Download**	**Cause:** **Remedy:**	**Writing to the flash memory resulted in an error.** **Repeat the flash download procedure. If the error persists, contact a technical support representative.**
DOWNLOADER ERROR **FLASH: W ADDR BAD** **Repeat Download**	**Cause:** **Remedy:**	**Writing to the flash memory resulted in an error in an area of memory.** **Repeat the flash download procedure. If the error persists, contact a technical support representative.**
DOWNLOADER ERROR **MAIN FLASH IS FULL** **Optimize Files**	**Cause:** **Remedy:**	**The main flash memory area is full.** **Delete files from the memory and optimize the space.**
DOWNLOADER ERROR **NO EFC DETECTED** **Repeat Download**	**Cause:** **Remedy:**	**No EFC was detected, so the download cannot proceed.** **Contact a technical support representative.**
EC SOFTWARE FAIL **Cycle Power**	**Cause:** **Remedy:**	**The Engine Control software has encountered a failure.** **Turn the printer OFF for 15 seconds, then ON again. If the problem persists, repeat the data download.**
ERROR: INSUFFICIENT DRAM **Cycle Power**	**Cause:** **Remedy:**	**Not enough available memory for a printer operation** **Turn the printer OFF for15 seconds, then turn it ON again. If the error persists, increase the Glob Mem Adjust size in the PRINTER SETUP menu and reboot the printer. If the error still persists, replace the controller PCBA. Write down the error message when returning the defective board.**
ERROR: INSUFFICIENT FLASH **Cycle Power**	**Cause:** **Remedy:**	**There is not enough available free flash memory to run the downloaded program.** **Turn the printer OFF for 15 seconds, then ON again. If the problem persists, contact your authorized customer service representative.**
ERROR OCCURRED: **CLEARING QUEUES** **Please Wait**	**Cause:** **Remedy:**	**The printer is discarding host data it cannot use because a fault condition exists. While this message displays, a rotating asterisk (*) appears on the screen.** **Wait. When the asterisk (*) stops rotating, a different fault message will appear; troubleshoot the final message.**
FILE SYS WRITE **Check Flash**	**Cause:** **Remedy:**	**There was a problem writing to the flash memory.** **Turn the printer OFF for 15 seconds, then ON again. If the problem persists, contact your authorized customer service representative.**

LCD Message	Description	
GAP NOT DETECTED **Check Sensor and Calibrate**	**Cause:**	**The printer is set for Gap or I-mark sensing, but the I-mark cannot be detected.**
	Remedy:	**1. Check that the setting of the Gap/Mark Sensor in the SENSOR SETUP menu matches the installed media.** **2. Check the position of the media sensors.** **3. Clean the sensor assembly and paper path.** **4. Run Auto-Cal to improve the sensor's ability to detect the media in use.** **5. Run the Media Profile printout in the SENSOR SETUP menu.** **6. Run Manual Calibrate.** **7. Manually change the Gap/Mark Thresh and/or Paper Out Thresh values.**
INVALID FILE SYS **Optimize&Reboot**	**Cause:**	**The file system was not detected, or the flash memory is corrupted.**
	Remedy:	**In the PRINTER SETUP menu, use the Optimize & Reboot option.**
LABEL MISSING **Check Media Path**	**Cause:**	**The label sensor did not detect any label with the Tear-Off or Peel-Off handlng mode enabled.**
	Remedy:	**Clear any stuck labels that may be causing the sensor to function abnormally. Check that the label path is clear, and select the correct handling mode for the media in use.**
LABEL READY **Remove Label**	**Cause:**	**A label was detected at the front of the printer by the label sensor in Peel-Off or Tear-Off Media Handling mode. Or, a label was removed, but the "Remove Label" message remains, if the incorrect Media Handling mode was selected.**
	Remedy:	**Check that all printed labels have been removed. Verify that a front door assembly is installed on the printer and that it is properly closed. Ensure that no debris is obstructing the door mirror or the Label Taken Sensor.** **Make sure that the correct Media Handling mode has been selected for the type of label in use.**
MEDIA OUT **Load Media**	**Cause:**	**Tear-Off or Peel-Off Media Handling selection was attempted with the cutter option still installed. These modes require that the front door assembly be installed to use the Label Sensor.**
	Remedy:	**Select a different Media sHandling Mode.**
MODE NOT COMPATIBLE WITH CUTTER **Check Media Mode**	**Cause:**	**Tear-Off or Peel-Off Media Handling selection was attempted with the cutter option still installed. These modes require that the front door assembly be installed to use the Label Sensor.**
	Remedy:	**Select a different Media sHandling Mode.**

LCD Message	Description	
OPTION NOT INSTALLED	**Cause:**	**If the printer is turned ON with the cutter enabled in the Media Handling menu, but the cutter itself is in the down position, or the cutter upper enclosure is removed, the printer cannot detect the cutter. When using the cutter, turn the printer ON with the cutter in the up position and the cutter upper enclosure installed.**
	Remedy:	**1. Check that the cutter option is installed, and connected in the up position and the upper enclosure is installed, before turning the printer ON.** **2. Install the cutter option or change to the correct Media Handling option in the MEDIA SETUP menu.** **3. If the error persists, contact your authorized customer service representative.**
PRINTHEAD HOT **Wait 5 Minutes** **Go Online**	**Cause:**	**The printhead has become overheated**
	Remedy:	**Allow the printhead to cool down for five minutes, then press resume printing. If possible, reduce print intensity. If problem persists, contact your authorized service representative.**
PRINTHEAD POWER FAIL **Call For Service**	**Cause:**	**There is no power to the print head.**
	Remedy:	**Replace the printhead. If the problem persists, contact an authorized service representative.**
PROGRAM IS NOT COMPATIBLE WITH THIS PRINTER **Repeat Download**	**Cause:**	**A non-compatible program file cannot be loaded into the printer.**
	Remedy:	**Make sure the program file is compatible with this printer, then try downloading again. If problem persists, contact your authorized service representative.**
RIBBON OUT **Load Ribbon**	**Cause:**	**The ribbon is broken, or some problem in the ribbon path has occurred.**
	Remedy:	**Check the ribbon path thoroughly and clear any problems that have occurred.**
RFID TAG MAX RETRY **Check Media**	**Cause:**	**The RFID tag is faulty.**
	Remedy:	**Do a reprint. When the error is cleared, the label with the failed tag moves forward to the next TOF position.**
RFID TAG MAX RETRY **Check Media**	**Cause:**	**Failed tag. Error displays in OVERSTRIKE mode. Each failed label prints with the OVERSTRIKE pattern; the form retries until the label retry count is exhausted.**
	Remedy:	**Clear the error. When the error is cleared, the label with the failed tag moves forward such that the next label is in position.**
SERIAL BUFFER OVERFLOW	**Cause:**	**Host sent data after the printer buffer was full (Serial Interface).**
	Remedy:	**Make a test printout. Verify that the serial interface parameters for host and printer are identical.**
SERIAL FRAMING ERROR	**Cause:**	**A frame error occurred.**
	Remedy:	**Verify that the serial interface parameters for host and printer are identical.**

LCD Message	Description	
SERIAL PARITY ERROR	**Cause:**	**A parity error occurred.**
	Remedy:	**Verify that the serial interface parameters for host and printer are identical.**
SOFTWARE ERROR **Cycle Power**	**Cause:**	**An illegal power function was initiated by an application software. Or there are damaged logic circuits on the controller PCBA.**
	Remedy:	**Turn the printer OFF and ON again. If possible, print a job that had previously worked. 2. If the problem persists, contact your authorized service representative.**
D50 STATUS: **CLEARING FLASH** **Please Wait** **D51: PROGRAMMING FLASH** **LOADING PROGRAM** **INTO FLASH** **Please Wait**	**Cause:**	**Emulation software successfully loaded into printer RAM and the checksum matched. The old program is now being deleted from flash memory. No action required.**
	Remedy:	**Wait for completion of the process.**

5.6 TROUBLESHOOTING GUIDE

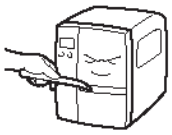
Symptom: The display remains blank when the power switch is pressed.

No.	What to check	Remedy
1	Has the power cable been inserted into the power outlet securely?	**Insert the power cable securely into the outlet.**
2	**Is the power cable damaged?**	Inspect the power cable for signs of damage. If possible, try using another printer power cable. Purchase a new power cable specifically designed for this printer, from the sales outlet or dealer where you bought the printer from. Never use any other power cable but the power cable specifically **designed for this printer.**
3	Is electricity coming to the power outlet feeding the printer?	Connect another electrical appliance to the power outlet to check for power. If there is a problem with the main power, check if electricity is coming to the building. Also check if power failure has occurred.
4	Has the power fuse of the building blown, or has the circuit breaker been tripped?	Replace the power fuse and reset the circuit breaker.

⚠ Caution

Do not operate the power switch or handle the power cable with a wet hand. You may suffer electric shocks as a result.

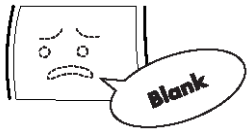
Symptom: Paper is fed but not printed

No.	What to check	Remedy
1	Is the printer head dirty, or is there any label stuck to the printer head?	If the printer head is dirty, wipe off the dirt with the supplied cleaning set. If a label is stuck to the printer head, take it away. * Do not use metallic object to remove it (the printer head may be damaged). If glue of the label is stuck to the printer head, wipe it off with the supplied cleaning set. 
2	Are you using genuine SATO paper and carbon ribbons for the printer?	Be sure to use genuine paper and carbon ribbon **specifically designed for the printer.**
3	**Is the paper sensor dirty?**	If the paper sensor is dirty, wipe off the dirt with **the supplied cleaning set. See Section 4: Cleaning and Maintenance.**
4	**Is the carbon ribbon wound correctly?**	If the knob of the ribbon-winding unit is not set to its original position, remove the carbon ribbon already wound, and return the knob to its original **position.**
5	**Is the data/signal sent from the computer correct?**	Turn on the power switch again. If the message still appears, check the software on the computer or the configuration for **connections.**

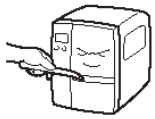
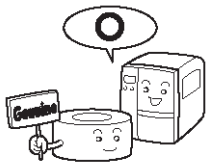
⚠ Caution

Pull out the power cable before cleaning the printer.

5.6 TROUBLESHOOTING GUIDE (CONT'D)



Symptom: Low quality print

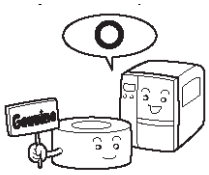
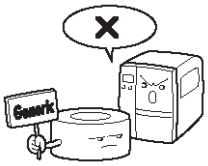
No.	What to check	Remedy
1	**Are the paper and carbon ribbon set correctly?**	Check if the paper and carbon ribbon are securely fixed. Also, lower the head-open lever of the printer head unit, and check if the paper and carbon ribbon are in the normal position.
2	**Are the paper and carbon ribbon set correctly?**	Check the paper and carbon ribbon. Set the print density again.
3	**Is the platen roller dirty?**	If the platen roller is dirty, wipe off the dirt with the supplied cleaning set.
4	**Is the printer head dirty, or is a label on the head?**	If the print head is dirty, wipe off the dirt with the attached cleaning set. If a label is on the head, take it away.  * Do not use a metallic object to remove it (the printer head may be damaged). If glue of the label is stuck to the printer head, wipe it off with the supplied cleaning set. See **Section 4: Cleaning and Maintenance**. **Determine if the print head needs replacement:** * Check for vertical streaking in the same location of every label. If cleaning the print head does not cause the streaking to be eradicated, then the printhead may be worn. Remove the printhead and examine it for physical damage or wear. * Load a different roll of labels and ribbon, and then run test prints again. If the vertical streaks continue to surface, then the printhead needs to be replaced. See **Section 4: Cleaning and Maintenance**.
5	**Are you using stained paper?**	**Use clean paper.**
6	Are you using genuine paper and carbon ribbon specifically designed for the printer? 	Be sure to use genuine paper and carbon ribbon **specifically designed for the printer.** 

⚠ Caution

Pull out the power cable before cleaning the printer.

5.6 TROUBLESHOOTING GUIDE (CONT'D)

Symptom: Print position is misaligned

No.	What to check	Remedy
1	**Are the paper and carbon ribbon set correctly?**	Fix the paper and carbon ribbon securely. Also, release the head-open lever of the printer head unit, then set the paper and carbon ribbon to the **normal position again. Finally, latch the print head back in place.**
2	**Is the platen roller dirty?**	If the platen roller is dirty, wipe off the dirt with the **supplied cleaning set.**
3	Is the paper/carbon ribbon you are using deformed?	If the edges of the paper/carbon ribbon are deformed, the paper cannot be fed normally. Use new paper/ carbon ribbon which are not deformed.
4	Are you using genuine SATO paper and carbon ribbons specifically designed for the printer? 	Be sure to use genuine paper and carbon ribbon specifically designed for the printer. Generic supplies may cost less, but can result in poor printing quality or shortened equipment life, leading to higher operating costs in the long run. 
5	**Is the paper sensor dirty?**	If the paper sensor is dirty, wipe off the dirt with the supplied cleaning set. See **Section 4: Cleaning and Maintenance.**
6	**Is the data/signal sent from the computer correct?**	Turn on the power switch again. If the error message still appears, check the software on the computer or the configuration of the connections**.**
7	Are the pitch correction (variable potentiometer) or base point correction (User Mode setting) correct?	Set the pitch correction (variable potentiometer) or base point correction (User Mode setting) again.

⚠ Caution

Pull out the power cable before cleaning the printer.

6

OPTIONAL ACCESSORIES

6.1 INTRODUCTION

This section contains details of the optional accessories available for the GL printer series:

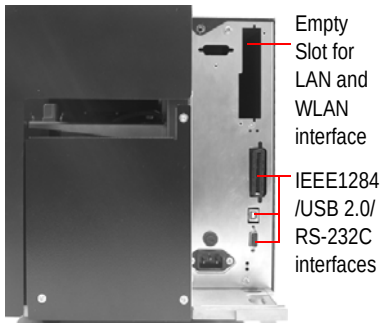
- Interface boards
- Peelers
- Cutters
- Winders
- Barcode Verifier
- RFID unit
- Additional memory

6.2 AVAILABLE INTERFACE BOARDS

The printer comes with the IEEE1284 parallel, serial and USB interfaces as standard. One space slot is available for the addition of an extra interface board to increase connectivity options. By installing an extra interface board, you can adapt GL printers to fit in a wide range of related equipment and usage scenarios.

The following interface boards are available for the GL series:

- ¤ 10BaseT/100Base-TX LAN interface board (optional)
- ¤ Wireless LAN IEEE802.11b/g interface board (optional)
- ¤ 14-pin EXT connector (external signal interface) (TBA)



⚠ Caution

Before installing or removing an interface board, be sure to turn off the printer first. Discharge static electricity from your body before touching any of the electronic parts. Failure to observe these precautions can result in severe damage to the components.

6.3 LABEL MANAGEMENT ACCESSORIES

- **Peel unit with mounting winder (factory option)**
  Mounts on the printer to automatically peel labels from their liner (mounting sheet) backing sheet. The winder in supplied to roll up the backing sheet neatly for easy disposal by the operator at a later time.

- **Simplified Dispenser (factory installed option)**
  Mounts on the printer to automatically peel labels from their liner (mounting sheet) backing sheet. No winder is supplied to roll the backing sheet neatly.

- **Cutter Unit and Tray (factory installed option)**
  Mounts on the printer to automatically cut labels as they are printed.

- **Cutter Unit for Linerless labels (factory option)**
  Mounts on the printer to automatically cut linerless labels—that is, labels that are supplied without mounting sheets.

- **Internal winding unit (factory option)**
  A winder that mounts inside the printer chassis, to roll up labels as they are printed.

- **Online Data Verification System with mounting stand (TBA*)**
  An advanced barcode verification system that can be programmed to selectively scan any or all printed barcodes for quality and readability. erifies the readability and quality of barcodes printed by the machine

- **RFID unit (factory option)**
  Enables the printer to read and write to a specified range of RFID tags and labels.

Instructions for installing each of the above accessories are supplied with the respective products. An authorized SATO reseller can also arrange to install the products on site.

For more information on any of the accessories available for the GL series printers, please contact an authorized SATO dealer near you.

* *Availability pending, To Be Announced later*

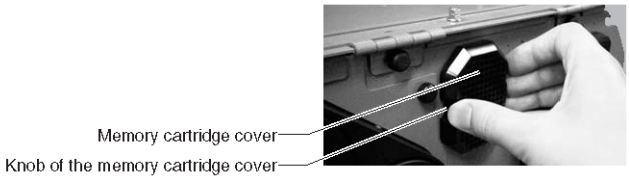
6.3 MEMORY CARTRIDGE

The GL series features a memory cartridge slot for the addition of optional memory cartridges that are purchased from SATO.

The memory cartridge slot is located behind a protective cover found within the printer's media storage area. Memory cartridges of 16 or 32 MB capacity can be installed for the storage of user data and graphics.

6.3.1 Installing the memory card

1. Lift up the front cover.
2. Tilt the knob of the memory cartridge cover inside and remove the memory cartridge cover.



3. Insert the memory cartridge.
4. Press the knob of the memory cartridge cover and press it firmly into place.

5. Close the front cover. The additional memory is now ready for use.
6. To remove the memory cartridge, reverse the procedure described here.

⚠ Caution

- If a memory access command is sent to the printer that does not have a memory cartridge present, an error will occur. In that case, make sure to install a memory cartridge before issuing any commands to access a memory cartridge.
- Before installing or removing a memory card, be sure to turn off the printer first.
- To prevent foreign objects and dust from entering the memory card slot, always make sure the memory card cover is firmly pressed into place, regardless of whether a memory card is installed or not.

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