



Operators and Technicians Manual

GEN2 UniversalTM Printer



PSA-66-ST2RU (RS232/USB)

While PSA-66-ST2 refers to all models of the printer, this manual is primarily for the RS232/USB interface of the GEN2 Universal printer.

Operators and Technicians Manual
GEN2 Universal™ Printer (PSA-66-ST2RU (RS232/USB))
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Table of Contents

ı	manuai Overview	••••	ı
	Introduction		
	Intended Audience		1
	Applicability		
	Conventions Used in this Document	••••	1
2	Product Overview	2	2
	Introduction	?	2
	Warranty Information	2	2
3	Operator Interface		3
	Introduction		
	Operator Indicators and Controls		
	Keypad Status Light	4	4
	Bezel Operation	4	4
	Printer Sensor Functions		
	Printer Errors		
	Loading Paper		
	Feeding Paper		
	Performing a Self Test		
	Clearing a Paper Jam		
_	Cleaning the Print Head		
4	Printer Service		
	Introduction		
	Removing the Printer		
5	Ports and Cables		
	Introduction		
	Front Bezel Port		
	RS232/USB Interface Cable		
	RS232 Evaluation Cable		
	GDS Adaptor Cable		
_	Firmware Upload Port		
	ppendix A Technical Specifications		
Αŗ	ppendix B Paper Specifications	20	J
Αŗ	ppendix C Part Numbers – Printer/Spares	2	1
-	ppendix D Schematics		
-	ppendix E Regulatory & Compliance		
-	dex	32	





List of Figures

Figure 3-1	Operator Indicators and Controls	
Figure 3-2	Load a Paper Stack	6
Figure 3-3	Feed Paper into Paper Loading Slot	
Figure 3-4	Sample Configuration Ticket	
Figure 3-5	Remove the Paper	7
Figure 3-6	Open the Lid	8
Figure 3-7	Clear the Paper Jam	8
Figure 4-1	Ground Screw and Copper Grounding Clips Location	9
Figure 4-2	Disconnect the Coiled Cable Connector	
Figure 4-3	Slide the Printer until It Locks	10
Figure 4-4	Remove the Paper	11
Figure 4-5	Push Release Bar	
Figure 5-1	Front Bezel LED Control Port	12
Figure 5-2	RS232/USB Interface Cable	13
Figure 5-3	RS232/USB Interface Cable, Auxiliary Communications	14
Figure 5-4	RS232 Evaluation Cable	15
Figure 5-5	GDS Adaptor Cable	16
Figure 5-6	Firmware Upload Port	17
Figure B-1	Ticket Dimensional Specification	

List of Tables

Table 3-1	Keypad LEDs Status Reporting Printer Condition	4
Table 3-2	Bezel Display Status	4
Table 3-3	Sensors	4
Table 3-4	Errors and Error Descriptions	5
Table 5-1	Front Bezel LED Control Port Pin-outs	12
Table 5-2	Base Port Cable Pin-outs	14
Table 5-3	RS232 Power/COMM Port Pin-outs	14
Table 5-4	USB Port (Series A) Pin-outs	14
Table 5-5	Bezel LED Control Port Pin-outs	14
Table 5-6	Evaluation Cable Bezel Port Pin-outs	
Table 5-7	Evaluation Cable 14 pin Base Port Pin-outs	
Table 5-8	Evaluation Cable DB9 RS232 Port Pin-outs	16
Table 5-9	GDS Adaptor Cable Connectors	16
Table 5-10	GDS Adaptor Cable Assembly	17





1 Manual Overview

Introduction

This manual is a comprehensive guide to the specifications and usage of the GEN2 Universal™ (PSA-66-ST2RU) printer. It contains detailed information on many areas of its operation.

The list below will assist you in determining which sections should receive attention first. It is helpful to review the list to obtain a cursory understanding of the scope of this manual.

We hope that this manual is easy to read and informative. If you have any comments we would like to hear from you. Email us at info@futurelogic-inc.com.

Specific Content	Location
To review the paper specification for ordering more paper	See Appendix B
To understand paper loading and operator controls	See Chapter 3
To clear a paper jam	See Page 7
To review the cabling and connector specifications	See Chapter 5

Intended Audience

The intended audience for this document is operators and technicians.

Applicability

This manual covers the GEN2 Universal (PSA-66-ST2RU) printer.

Conventions Used in this Document

This document uses the following conventions.

Example	Description
	This is a note. A note includes information that emphasizes or supplements important points of the topic.
This is a tip. A tip provides techniques and procedures to aid with a task.	
	This is a Caution. A Caution emphasizes information that may cause damage to equipment and/or injury to a person.
Bold text	This document uses bold text to identify a field, a command selection, and an option selection.
Button	This document uses button text to identify a button to press. For example, Click the FEED button.





2 Product Overview

Introduction

Each GEN2 Universal™ printer is an advanced thermal printer capable of creating high quality complex output with a minimum of development and effort on the part of the user.



Note: While PSA-66-ST2 refers to all models of the printer, this manual is primarily for the RS232/USB interface of the GEN2 Universal printer.

Features of the GEN2 Universal printer include:

- The ITH® (Intelligent Ticket Handling) technology that prevents player interference with any part of ticket production or presentation
- · May be mounted on an angle or horizontally
- · Simple paper loading—no loose parts
- · Variable paper capacity with different paper trays—300, 600, and 900 ticket trays
- · Windows® ticket/receipt development package via the TCL™ Editor utility
- · Page mode printing with TCL printer language
- · Line printer capability
- · High quality laser-like san serif fonts in multiple sizes
- Advanced graphics printing
- Windows connectivity
- · 3.5" inch per second print speed
- · Wide temperature range operation
- · Standard and customized serial interfaces available—RS232 and USB

Additionally, a key feature of the GEN2 Universal printer is Universal Communications:

- USB 2.0 Full Speed (Future GSA Compliant™, IGT Compliant)
- · RS232 Port (Backward Compatible)

Warranty Information

Each printer has a two-year warranty as per the manufacturer's written warranty.





3 Operator Interface

Introduction

This chapter covers various operations of the printer including loading paper and clearing a paper jam.

Operator Indicators and Controls

The printer is equipped with status indicators and a **FEED** button for the management and interpretation of the printer operations.

The status indicators are:

- · Front bezel light
- Keypad lights:
 - · Ready Green
 - · Paper Yellow
 - · Open Orange
 - Fault Red

The following figure illustrates the location of these indicators and controls.

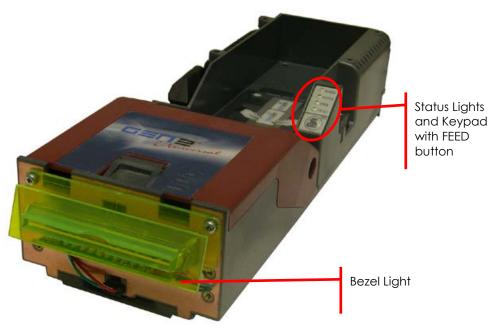


Figure 3-1 Operator Indicators and Controls





Keypad Status Light

The keypad LEDs report the status of the printer whenever power is present. Table 2-1 lists each condition of the keypad LEDs.

Table 3-1 Keypad LEDs Status Reporting Printer Condition

Condition	Ready	Paper	Open	Fault
Unit is Powered Off				
Unit Ready	blink			
Unit Flushed				
Paper Out				
Head Up or Ticket Module Open				
Temperature Error				
Voltage Error				
Print Head Error				
Missing Black Index Mark				
Paper is Jammed				blink
= LED ON.				

Bezel Operation

Use the front bezel display to determine the state of the printer while on the casino floor, at a distance, without disturbing the game. Table 2-2 lists the conditions indicated on the bezel display.

Table 3-2 Bezel Display Status

Bezel Display	Status
Solid On	Printer Idle and Ready
Slow Blink	Paper Low or Printer Error
Fast Blink	Ticket Printing and/or Ticket in Chute
Off	Printer power off

See Chapter 5 for information on the current ratings of the bezel ports.

Printer Sensor Functions

There are six primary sensor functions on the printer. These sensors work with the game firmware to provide reliable trouble-free operation. Any error conditions resulting from these sensors are indicated by the front bezel light and keypad LEDs. Table 3-3 describes each of these sensors.

Table 3-3 Sensors

Sensor	Description	
Paper Out	The Paper Out sensor is located in the print head. It terminates the print operation when	
	the paper has run out and checks for proper form registration. The printer ceases printing	
	and feeding operations when it detects a Paper Out condition. Correct a Paper Out	
	condition by loading more paper into the unit.	
Paper Low	The Paper Low sensor is located in the paper well. It determines when the paper stack has	
	approximately 2 tickets. A Paper Low condition automatically resets once a stack with a	
	greater height is loaded. Paper low sensing occurs when the system is idle and takes a few	
	seconds to detect the new paper level.	
Paper Taken The Paper Taken sensor is located in the presentation chute of the printer. It de		
	when the customer has actually taken their cashout ticket.	
Drawer Open	The Drawer Open sensor is located in the paper well. It detects when the printer is open.	





Sensor	Description	
Platen Engaged	he Platen Engaged sensor is located in the print head. It detects when the printer platen	
	is in use.	
Printer Open	The Printer Open sensor is located in the front of the unit. It detects when the printer	
	clamshell is open.	

Printer Errors

Although there are a variety of error conditions that can occur, most printer errors are a result of the printer running out of paper or the operator opening the lid. Table 3-4 lists possible errors and the remedy for each condition.

Table 3-4 Errors and Error Descriptions

Error	Error Description	Remedy
Paper Out	Results when the printer does not detect paper	Load a new paper stack.
	present.	
Head Up or	Results from raising the Side Release Lever or	Lower the yellow lever on the side
Open	opening the lid.	of the unit.
Temperature	Results when the printer is operating outside of its	The printer will automatically
	allowable temperature range.	resume operation after the
	If the printer is operating in an environment where	detected head temperature falls
	the ambient temperature is roughly room	within range.
	temperature, this error would most likely be the	
	result of a hardware problem.	
Voltage	Results if the printer detects a power supply voltage	The printer will automatically
	(+24VDC to +25VDC) outside range. This error could	resume operation after the power
	be the result of a poor cable connection.	supply is detected within range.
Print Head	Results when the printer senses an internal error due	The printer will remain in this
	to connectivity or interfacing problem with the	error state until the power is
	thermal print head. This can be a result of a cable	cycled or the unit is reset.
	problem between the main controller board and the	If the problem persists, the printer
	printer engine.	will require service.
Missing Black	Results if the paper type selected is indexed paper	Raise the Main Release Lever
Index Mark	and while feeding paper or printing a black mark is	(presumably to change the paper).
	not seen within approximately 10" of the paper.	
	This error alerts the user to the presence of the wrong	
	kind of paper in the printer or that the paper was	
	inserted in the wrong direction (so the black mark	
	index is rotated 180 degrees).	
Paper Jam	Results when the printer detects an error in the	Open the printer head and inspect
	paper path for presenting the ticket to the customer.	for a jammed ticket.

Loading Paper

Generally, the only printer service required is to load new paper stacks. Use the automatic paper-loading feature to simplify this process to two steps: putting the paper stack into the Paper Tray and feeding the paper to the Paper Loading Slot of the printer.

To load paper:

- 1. Pull open the Printer Drawer until the Paper Tray is completely accessible.
- 2. Place the paper stack in the printer as indicated by the band around the stack and the label on the bottom of the Paper Tray.



Tip: To prevent a new paper stack from sticking together, fan out the paper after you take off the band.





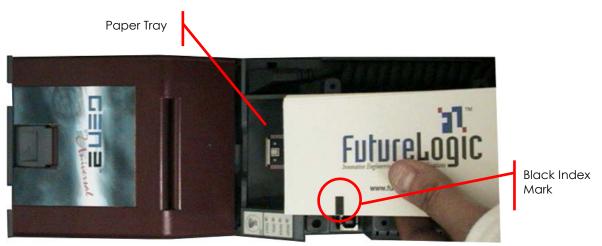


Figure 3-2 Load a Paper Stack

3. Feed the paper into the Paper Loading Slot and release it once the motor engages and the printer takes hold of the paper.

The printer pulls through a form or two, leaving it registered at the top of a form.



Figure 3-3 Feed Paper into Paper Loading Slot

4. Remove any excess ticket(s) from the printer.

Feeding Paper

The printer is designed to run with black mark indexed paper.

To feed paper into the printer:

Press the **FEED** button.

Additionally, press the **FEED** button to advance the paper to the top of the next form.





Performing a Self Test

To run a self test:

· Press the **FEED** button during power-up or reset.

This self test prints a configuration ticket if the test passes successfully. The test ticket (illustrated in Figure 3-4) contains important information on how the unit is configured.

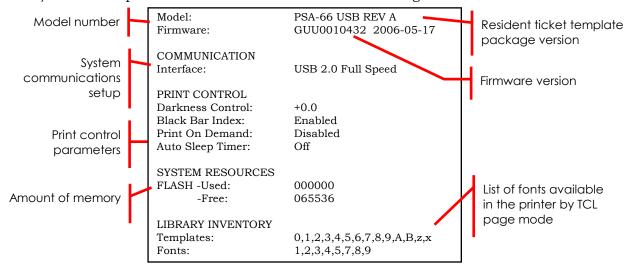


Figure 3-4 Sample Configuration Ticket

Clearing a Paper Jam

The printer operates reliably with minimal paper jamming. To clear a paper jam, follow the instructions below. After you clear a paper jam, perform these steps in reverse to load paper.

When clearing a paper jam:

- Ensure that all paper paths from the entry point at the back of the paper well, through the printer, cutter, and the ticket module chute are clear of paper or obstructions.
- · Use the Lid Release Lever located on the top of the unit.
- Do <u>not</u> allow a screwdriver or other probing object to come in contact with the printer. This can cause permanent damage to the printer.

To clear a paper jam:

1. Remove the paper from the printer.



Figure 3-5 Remove the Paper





2. Open the lid by pressing the Lid Release Lever.

The spring-loaded lid opens, exposing the paper path.



Figure 3-6 Open the Lid

- 3. Remove the jammed ticket.
- 4. If necessary, access the paper path through the print mechanism by opening the Main Release Lever.

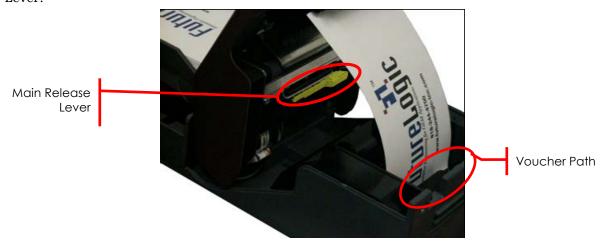


Figure 3-7 Clear the Paper Jam

- 5. Once you clear the jam, reverse these steps to return the printer to a ready state.
- 6. Load the paper.

Cleaning the Print Head

See MNL-000054, Printer Cleaning Guide for details.





4 Printer Service

Introduction

This chapter provides instructions on how to remove the printer to service it outside of the game.



Note: While the printer is hot connectable, it is still a good maintenance procedure to turn off the power.



Important Information!

Do <u>not</u> remove the ground screw in the rail as it will release the internal nut!

After removing the printer, do <u>not</u> slide the unit on a tabletop or other surface. Doing so will cause damage to the copper grounding clips on the bottom of the unit.

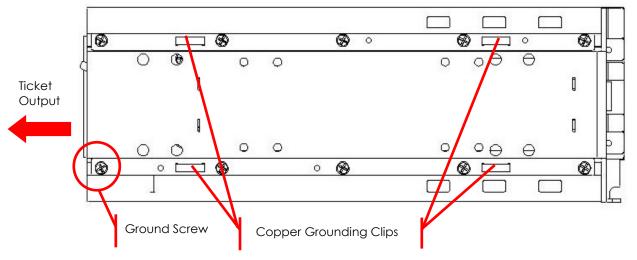


Figure 4-1 Ground Screw and Copper Grounding Clips Location





Removing the Printer



CAUTION!

ESD Sensitive Equipment!

Electronic boards and their components are sensitive to static electricity. Care must be taken during all handling operations and inspections of this product in order to ensure product integrity at all times.

Do not handle this product out of its protective enclosure while it is not used for operations purposes unless it is otherwise protected.

Discharge your clothing before touching the assembly. Discharge tools before use.

Whenever possible, unpack or pack this product only at EOS/ESD safe workstations. Where a safe workstation is not guaranteed, it is important for the user to be electrically discharged before touching the product with his/her hands or tools.

To remove the printer:

- 1. Disconnect the power.
- 2. Disconnect the Coiled Cable Connector.



CAUTION! The cable is under tension.



Figure 4-2 Disconnect the Coiled Cable Connector

3. Slide the printer out until it stops in the stationary module.



Figure 4-3 Slide the Printer until It Locks





4. Remove the paper from the printer.



Figure 4-4 Remove the Paper

5. Push the Release Bar (located under the bottom of the printer) to remove. While holding in the Release Bar, gently pull the printer towards you.

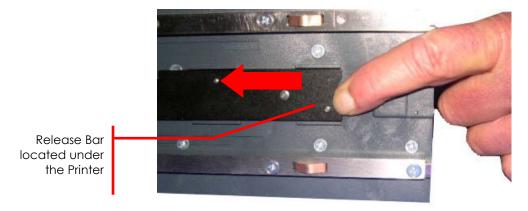


Figure 4-5 Push Release Bar



Important Information!

After removing the printer, do <u>not</u> slide the printer on a tabletop or other surface. Doing so will cause damage to the copper grounding clips on the bottom of the printer.





5 Ports and Cables

Introduction

This chapter describes the interface connectors and port pin-outs for the printer. For complete electrical specifications on these ports, refer to Appendix A in the Developers Manual (MNL-000033) for the power connector.



Note: While PSA-66-ST2 refers to all models of the printer, this manual is primarily for the RS232/USB interface of the GEN2 Universal printer.

Front Bezel Port

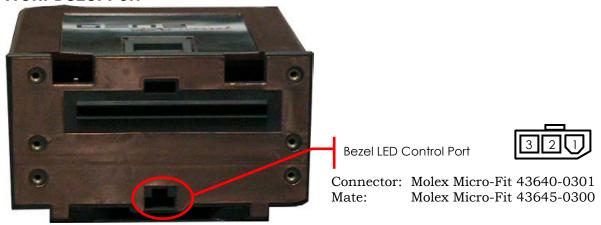


Figure 5-1 Front Bezel LED Control Port

Table 5-1 lists information on the LED bezel port on the printer. This is an open drain modulated high side drive 25VDC port capable of driving up to a maximum 1.5A.

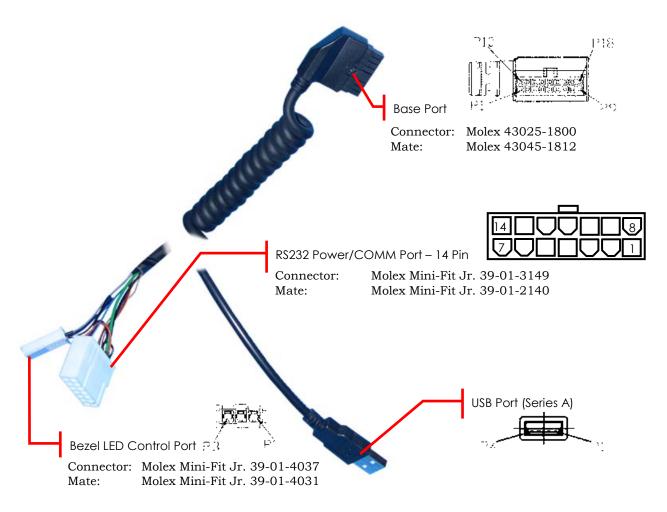
Table 5-1 Front Bezel LED Control Port Pin-outs

Pin	Function	
1	Switched 25VDC, 100mA Min	
2	BGND	
3	Frame (Chassis) Ground	





RS232/USB Interface Cable



RS232/USB 14 Pin Cable P/N 150-00176-100

Figure 5-2 R\$232/USB Interface Cable





Table 5-2 Base Port Cable Pin-outs

Pin	Function
1	RAW BGND
2	D-
3	+13V
4	SWITCHED 24V
5	DTR 232
6	MRESET
7	D+
8	RAW 24V
9	RTS 232
10	RX2/SCL
11	TX2/SDA
12	RX1/232
13	TX1 232
14	TX1 NET
15	RX1 NET
16	OPTO GND
17	DGND
18	+9 – 14V

Table 5-3 RS232 Power/COMM Port Pin-outs

Pin	Function
1	MRESET
2	Netplex TXD
3	+12 VDC (RS232 optional)
4	Netplex RXD
5	GND
6	+24 VDC
7	GND
8	+24 VDC
9	Modulated +24VDC
10	GND
11	RS232 RXD
12	RS232 TXD
13	DTR
14	RTS

Table 5-4 USB Port (Series A) Pin-outs

Pin	Function		
1	USB BUS SUPPLY		
2	D-		
3	D+		
4	GND		

Table 5-5 Bezel LED Control Port Pin-outs

Pin	Function
1	SWITCHED 24V
2	NO CONNECT
3	GND



Note: For Bezel LED Port on cable, no Intermitted or in rush current exceeding 1.5A is allowed.

As a special order, the GEN2 Universal RS232 Interface Cable also is available with an auxiliary communication port. Please contact FutureLogic for details.

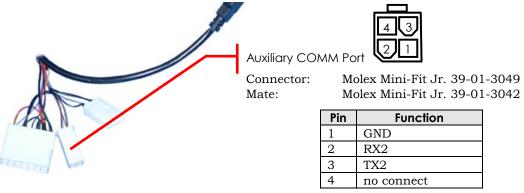


Figure 5-3 RS232/USB Interface Cable, Auxiliary Communications





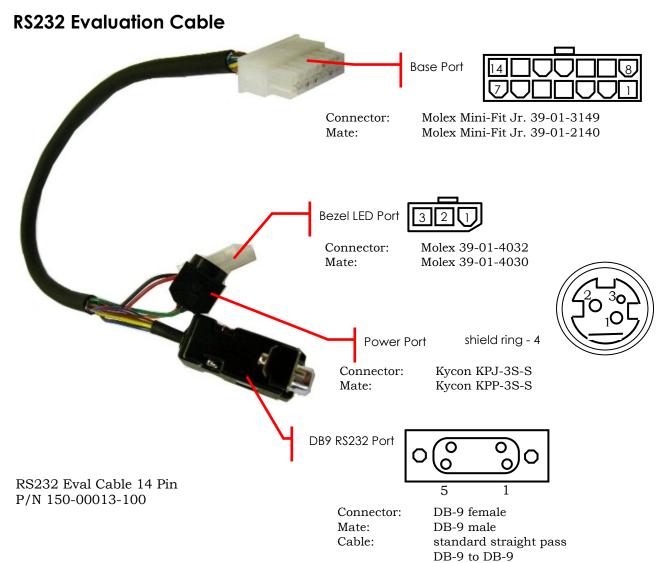


Figure 5-4 RS232 Evaluation Cable

The Bezel port on the rear of the unit is identical in function and characteristics to the one on the front of the unit described earlier.

Table 5-6 Evaluation Cable Bezel Port Pin-outs

Pin	Function		
1	Modulated +24VDC		
2	No connect		
3	GND		



Note: For Bezel LED Port on cable, no Intermitted or in rush current exceeding 1.5A is allowed.





The following table lists the pin out of the 14 pin base port. The Modulated +24VDC pin has the same function as the bezel port pin.

Table 5-7 Evaluation Cable 14 pin Base Port Pin-outs

PIN	FUNCTION	I/O*
1	No connect	-
2	No connect	-
3	No connect	-
4	No connect	-
5	GND	-
6	+24 VDC	-
7	GND	-
8	No connect	-
9	Modulated +24VDC	О
10	GND	-
11	RS232 RXD	I
12	RS232 TXD	О
13	DTR	О
14	RTS	О

t	617	
*T	O viewed from the printer	
··· I	/O viewed from the primter	

Table 5-8 Evaluation Cable DB9 RS232 Port Pin-outs

Pin	Function	I/O*
1	No connect	-
2	TX	О
3	RX	I
4	No connect	-
5	GND	-
6	DTR	О
7	No connect	-
8	RTS	О
9	No connect	-

^{*}I/O viewed from the printer

GDS Adaptor Cable

The GDS adaptor cable changes the RS232 14 pin down to a 1 x 4 Molex mini fit to match the GDS power connector standard.

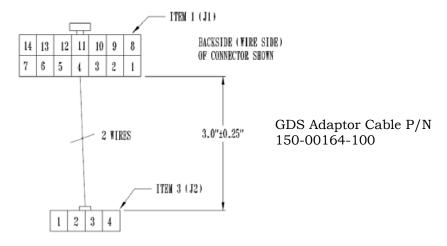


Figure 5-5 GDS Adaptor Cable

Table 5-9 GDS Adaptor Cable Connectors

From Connector	To Connector	Color	Length
J1-5	J2-3 *	Black	3.0" ±0.25"
J1-6	J2-4	Red	3.0" ±0.25"

^{*} Use Grounding Terminal (Item 5) for J2-3.



Table 5-10 GDS Adaptor Cable Assembly

Item #	Qty	FL. Part #	Description	OEM	OEM Part #
1	1	170-00267-100	Conn, 14 Ckt, 2x7, 4.20MM Pitch	Molex	39-01-2145
2	2	170-00172-100	Term, Crimp, Female, 18-24AWG, 4.20MM Pitch	Molex	39-00-0038
3	1	170-00269-100	Conn, 4 Ckt, 1x4, 4.20MM. Pitch, Free Hanging	Molex	39-01-4046
4	1	170-00149-100	Term, Crimp, Male, 18-24AWG	Molex	39-00-0040
5	1	170-00152-100	Term, Crimp, Male, 18-24AWG, Grounding Pin	Molex	30490-2002
6	.28	513-00061-100	Wire Stranded, 20 AWG, Red, 1 Ft.	Belden	9982-2
7	.28	513-00062-100	Wire Stranded, 20 AWG, Black, 1 Ft.	Belden	9982-10

Firmware Upload Port

The Firmware Upload Port upgrades the printer firmware while the printer is installed and powered in the game. The printer uploads through its Firmware Upload Port just as it would through its communications connector at the rear of the printer.

To use this port, slide the printer out until the upload port (shown in the following figure) is visible. Then plug an appropriate upgrade cable into the printer. This connection may be made while the power is on.

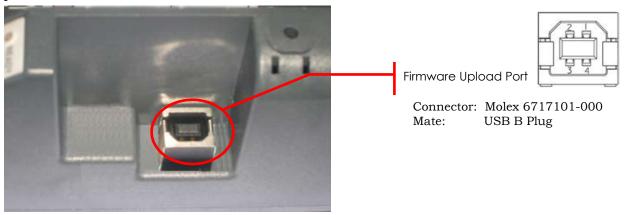


Figure 5-6 Firmware Upload Port





Appendix A Technical Specifications

This appendix identifies the general specifications of the printer.

General	
Dimensions (WxDxH)	110 x 304.8 x 64.3 mm
Weight	2.7 lbs.
Power Requirements	These units are to be supplied by Listed or IEC Certified Power Supplies, rated 24 VDC, minimum 2.7 A, marked "Class 2" or "LPS". (4.0A peak with 60% gaming ticket)
Sensors	Paper Low, Paper Out, Printer Drawer Open, Ticket Taken, Ticket Jam, Ticket in Chute, Black Mark (Includes a Host Controllable Buzzer)
Printing Speed	90mm/Second (3.5"/Second)
Print and Present	2.2 Seconds
Printing Width	62mm (true near-edge printing)
Storage	300 Tickets
Ticket Tray Extenders	Interchangeable, 600, 900 Ticket Tray
Resolution	8 dots/mm (203 dpi)
Firmware	Application in Memory is Reprogrammable (via Flash BIOS)
Self Test	Yes
Page Mode	Full Page Mode Printing (Simultaneous 4 Orientation Printing: 0°, 90°, 180°, 270°) Line and Box Draw Printer Resident Bitmap Graphics Printer Resident (Stored in Flash) Graphics
Paper Loading	Manual
Paper Feed	Automatic Hands Free
Method	Direct Thermal, Top Coated, Fanfolded and Perforated
Paper Specification	66mm W x 156mm L 4.5 mil, 1 Color/2 Colors
Bezel Control	Two High Current Ticket Printing Bezel Control Ports
User Interface	4 LED Indicators, Paper Advance Button
Upgrade Port	Allows for Printer Upgrades via USB Download or RS232 Main port
Hot Swappable	100%
Duty Cycle	Max. continuous feed of 1200 tickets with 8-second delay between tickets
Printing Resources	
Template Capacity	8Mb; Stores hundreds of clip art objects & thousands of graphic templates
Graphic Storage	6Mb
Color Printing	Red on Black and Blue on Black are available. Other colors can be supported as the print media becomes available. Color selection is controlled through the TCL TM language.





Characteristics	
Printer Languages	TCL Printer Language (Page Description Language)
	Subset of ESCP2
Fonts	8 (2.5 cpi, 3.3 cpi, 4.0 cpi, 5.5 cpi, 5.6 cpi, 7.3 cpi, 10.1 cpi, 20.5 cpi)
Font Scalability	May Be Independently Scaled from 1x - 7x in Both Height and Width
Bar codes	PDF-417, Interleaved 2 of 5, Code 39, UPC-A, UPC-E, UPC-E+2, UPC-E+5,
	Codabar, EAN-13, EAN-8, Code 128, MSI
Memory	2MB with 512K RAM
Interface	
Communications	USB 2.0 game interface (full speed of 12Mbps) with separate
	USB Download Port, Future GSA Compliant, Compliant with GSA, GDS, IGT
	USB and traditional protocols RS232C and Netplex
Environmental	
Operating temperature	5°C to 50°C
Storage temperature	-20°C to 75°C
Operating humidity	5 to 85% RH non-condensing
Reliability	
Maintenance	Annual Print Head Cleaning Required
Print Head Life	100km Min. (656,000 Tickets Based on US Currency Size)
Certifications	CE Certified, ISO 9001, RoHS, UL





Appendix B Paper Specifications

This appendix provides information on the paper used in the printer. For authorized ticket converters and complete paper specifications, contact your sales representative or visit our Web site: www.futurelogic-inc.com.



Note: Use only approved paper in the printer. Use of improper paper may cause damage to the device and will void the printer's warranty.

Nominal paper thickness: 4.5mil Paper dimensions: 65mm x 156mm

Ticket Stack
Ticket, 300STK, 65X156, 5M, Fanfold
Ticket, 600STK, 65X156, 5M, Fanfold
Ticket, 900STK, 65X156, 5M, Fanfold

Note: Paper width is +0mm, -1mm.

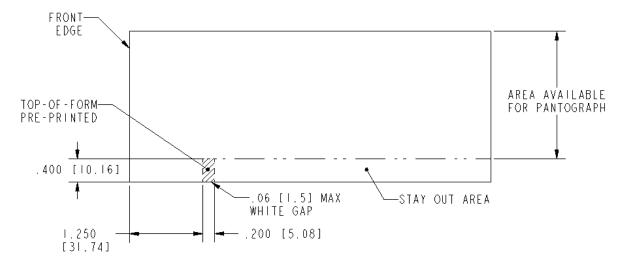


Figure B-1 Ticket Dimensional Specification





Appendix C Part Numbers – Printer/Spares

This appendix provides the part number and description of the GEN2 Universal (PSA-66-ST2RU) printer and spare parts.

Printers – P/N	Description		
220-00086-300	GEN2 Universal Printer (RoHS) PSA-66-ST2RU USB, RS232, Future GSA Compliant*	RoHS Versions—Look for either of these labels:	Fullelone Control of the Control of

Spares – P/N	Description	
370-00015-100	Base RoHS	The state of the s
370-00170-100	Bottom Chute RoHS	
150-00176-100	Cable, USB-RS232, 14 pin RoHS	
150-00013-100	Cable, Evaluation, RS232, 14 pin RoHS	
150-00164-100	Cable, GDS Adaptor	





Spares – P/N	Description	
370-00021-100	Floating Part RoHS	
370-00024-100	Hinge RoHS	
370-00025-100	Hinge Pin RoHS	
500-00005-100	Keypad Membrane RoHS	Service of the servic
362-00047-107	Lid, Label RoHS	- Commune
370-00020-100	Lid, Top, Red RoHS	
370-00022-100	Locker RoHS	
370-00023-100	Locker Base RoHS	
370-00016-100	Main Bracket RoHS	





Spares – P/N	Description	
140-00099-100	Paper Taken Sensor Board RoHS	
140-00161-103	PCBA, GEN2 Mother board, with the new Low Paper Sensor (interrupter sensor) RoHS	
460-00005-100	Platen Shaft Assembly RoHS	
350-00031-102	Power Supply RoHS	
400-00007-100	Print Mech, F03-66 RoHS	
310-00112-100	Release Bar Bracket RoHS	
310-00115-100	Release Bar Guide RoHS	
460-00006-100	Roller Idler RoHS	
473-00078-100	Screws (100 pack) RoHS	<u>-</u>
485-00008-100	Spring (50 pack) RoHS	





Spares – P/N	Description	
370-00026-100	Spring Plate RoHS	
482-00012-100	Star Washers (100 pack) RoHS	
320-00224-101	Ticket Extension Tray, 600 Tickets RoHS	S 50
320-00224-102	Ticket Extension Tray, 900 Tickets RoHS	
370-00019-100	Top Presenter RoHS	
370-00291-100	Tray, Paper RoHS	





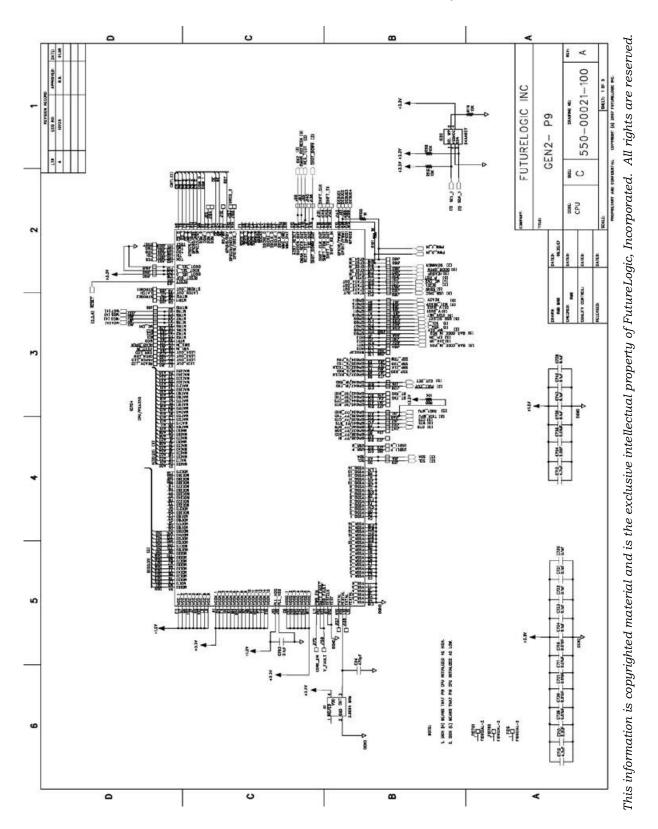
Appendix D Schematics

The schematics included in this appendix are provided solely for use by technicians who service the GEN2 Universal printer. This information is provided AS IS and without warranty, expressed or implied.

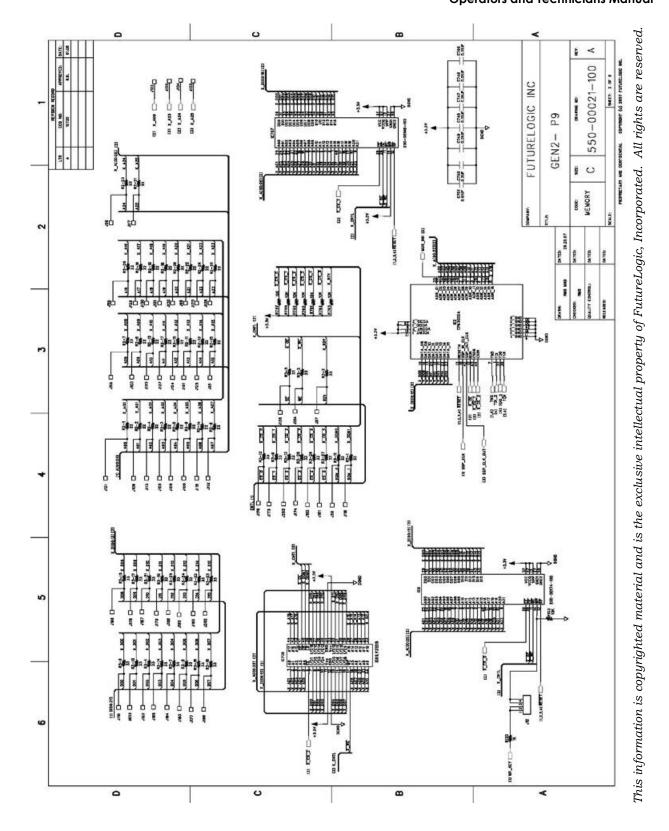


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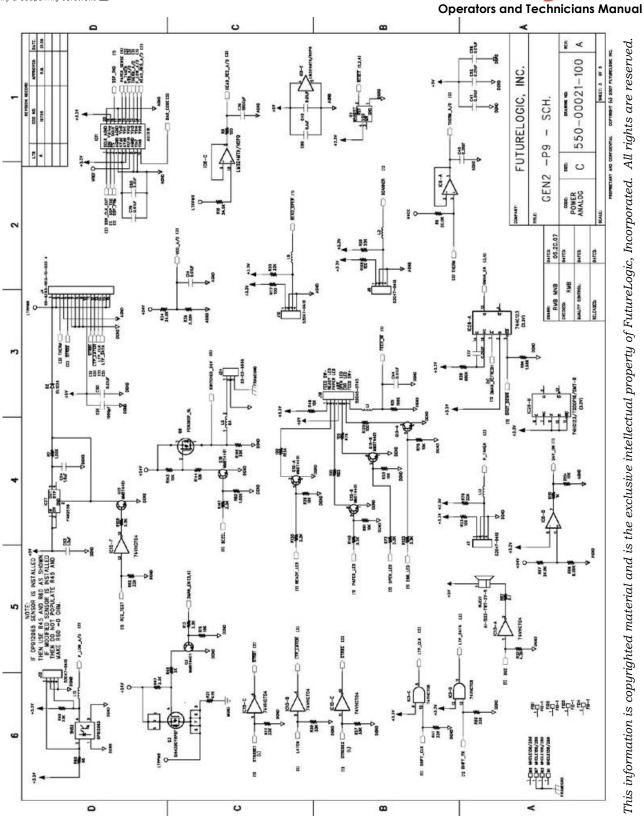






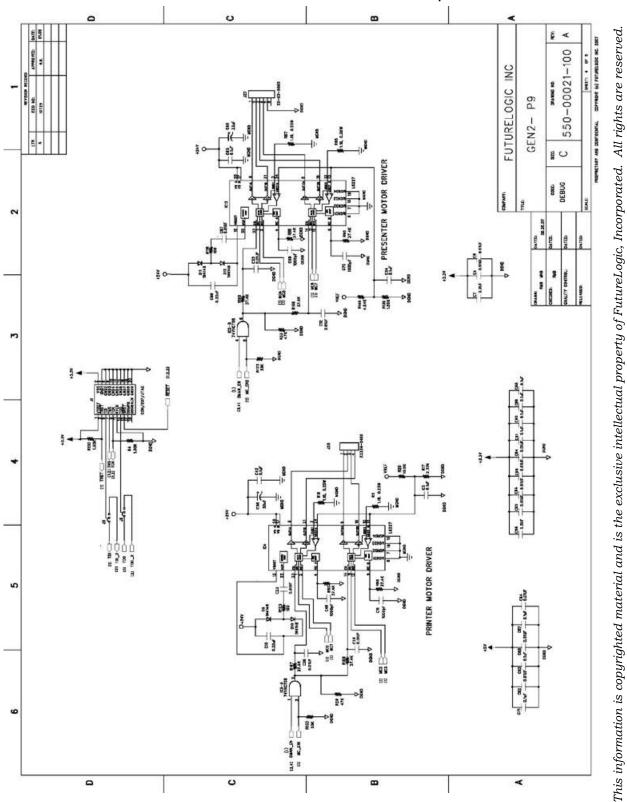






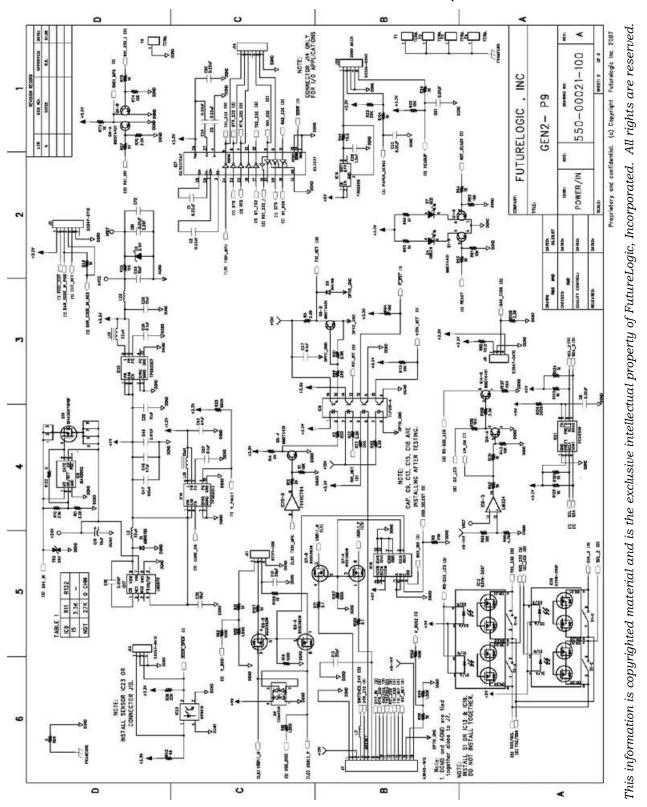


Operators and Technicians Manual





Operators and Technicians Manual







Appendix E Regulatory & Compliance



The printer described in this manual is in compliance with all applied CE standards.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.





Index

paper jam, clearing, 7

B bezel, 4 black mark indexed paper, 6 C configuration ticket, 7	part numbers, 21 print head, cleaning, 8 printer bezel LED control port, 12 firmware upload port, 17 removing, 10 self test, 7 specifications, 18
E	R
errors Head Up, <i>4</i> , <i>5</i>	RS232/USB interface cable, 13
Missing Black Index Mark, 4, 5 Paper Jam, 4, 5 Paper Out, 4, 5 Print Head, 4, 5 Temperature, 4, 5 Voltage, 4, 5 F FEED button, 3, 6	schematics, 25 sensors, 4 Drawer Open, 4 Paper Low, 4 Paper Out, 4 Paper Taken, 4 Platen Engaged, 5 Printer Open, 5
L LEDs, <i>4</i>	T may not to a
P	TCL Editor, 2 ticket dimensional specifications, 20
paper capacity, 2 feeding, 6 specifications, 20	${f W}$ warranty information, 2



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