

OPERATORS AND TECHNICIANS MANUAL

PSA-66-ST PSA-66-001N

RS232 Interface Netplex Interface

INDUSTRIAL, DIRECT THERMAL GAMING / LOTTERY MACHINE VOUCHER PRINTER



UTURELOGIC PSA-66-001N PSA-66-ST



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IMPORTANT NOTES REGARDING THIS MANUAL

specifications are subject to These change without notice and may not completely and correctly document the operation of this product.

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FUTURELOGIC Innovative Engineering for OEM Applications **PSA-66-001N PSA-66-ST**

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1 PRODUCT OVERVIEW

1.1 PSA-66-ST and PSA-66-001N Highlights

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The PSA-66-ST refers to both the PSA-66-ST and PSA-66-001N versions and is an advanced thermal printer capable of creating high quality complicated output with a minimum of development and effort on the part of the user. The printer module supports both serial and a Netplex current loop interface to allow it to operate in any standard slot machine on the market.

PSA-66-ST FEATURES

SIMPLE PAPER LOADING no loose p	arts		
VARIABLE PAPER CAPACITY VIA PAPER TRAYS 200, 400, 600 & 1000 trays	ticket		
PROMOTIONAL PRINTING CAPABILITIES			
PAGE MODE PRINTING WITH TCL PRINTER LANGUAGE			
LINE PRINTER CAPABILITY			
HIGH QUALITY LASER LIKE SAN SERIF FONTS IN MULTIPLE SIZES	HIGH QUALITY LASER LIKE SAN SERIF FONTS IN MULTIPLE SIZES		
ADVANCED GRAPHICS PRINTING			
WINDOWS CONNECTIVITY			
3 INCH PER SECOND PRINT SPEED			
2K INPUT BUFFER			
WIDE TEMPERATURE RANGE OPERATION			
STANDARD AND CUSTOMIZED SERIAL INTERFACES AVAILABLE RS23 Netpl	32 ex		

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OPERATOR INTERFACE

2.1 Operator Controls and Indicators

The printer is equipped with 2 status indicators and 2 operator controls to allow the operator to know the status of the printer at all times. The status indicators are:

- The front bezel light
- The STATUS and ERROR LEDs on the keypad

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The operator controls for the printer are:

- The FEED key
- The platen release lever

Figure 2-1 below illustrates the location of these controls and displays. The purpose of this section is to detail the operation of the printer around these displays and controls.



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2.2 Printer Sensor Functions

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There are 6 primary sensor functions on the PSA-66-ST printer:

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- Paper out
- Paper level low
- Paper taken
- Paper jam
- Printer platen engaged
- Printer opened

These sensors work in conjunction with the game firmware to provide reliable trouble-free operation. Any error conditions as a result of these sensors will be indicated by the front bezel light and keypad LEDs.

2.3 Paper Loading

Generally, the only service required for printer is to load new paper stacks. This section provides a step by step description of how to load paper to the unit. The automatic paper loading feature of this system simplifies this process to essentially two steps; putting the paper stack into the printer paper tray, and presenting paper to the paper feed slot in the printer. The platen release lever, the paper advance button and the cutter operate button are merely provided as supports for this process, and usually are not required to load paper.



Follow these steps to load paper:

Pull open the printer drawer until the paper tray is completely accessible. Place the paper stack in the printer as indicated by the band around the stack and the label in the bottom of the paper tray.





2.4 **Bezel Operation**

The front bezel display allows the operator to determine the state of the printer on the casino floor, at a distance, without disturbing the game. The table below lists the various conditions which the bezel indicates.

Table 2-1 **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

2.5 **Keypad LED Operation and Printer Status Conditions**

The keypad LEDs provide a more detailed reporting of system status. Table 2-2 below lists the status of the keypad LEDs in a variety of status which are defined following.

CONDITION	STATUS_LED	ERR_LED
Unit in Powered Off	0FF	0FF
Unit Ready	ON	OFF
Unit Flushed	ON	ON
Paper out	OFF	ON
Head Up	OFF	ON
Temperature Error	OFF	MED BLINK
Voltage Error	OFF	SLOW BLINK
Print Head Error	ON	FAST BLINK
Missing Black Index Mark	ON	FAST BLINK
Paper Jam	ON	FAST BLINK

Table 2-2 **Keypad LEDs Status Reporting**

Although there are a variety of error conditions which can occur, most printer errors are a result of the printer running out of paper or the operator raising the head up lever. This section lists the possible error which can occur, and how the condition is remedied.

PAPER OUT: This condition results when the printer detects that paper is not present. The printer scans for a paper out condition at all times. Remedy the condition by loading a new paper stack.

This condition results from lowering the head release lever. To remedy the error, it is HEAD UP: necessary to raise the blue lever on the side of the unit.

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TEMPERATURE ERROR: This condition results when the printer is in an over temperature condition. If the printer is operating in an environment where the ambient temperature is roughly room temperature, this error would most likely be the result of a hardware problem. The printer will automatically resume operation after the detected head temperature reaches legal operation limits.

VOLTAGE ERROR: If the printer detects a power supply voltage (+24VDC to +25VDC) outside of legal limits, then a voltage error occurs. This error could be the result of a poor cable connection. The printer will automatically resume operation after the power supply is detected within legal limits.

PRINT HEAD ERROR: This type of error occurs when the printer senses an internal error due to connectivity or interfacing problem with the thermal print head. This can be a result of a cable problem between the main controller board and the printer engine. The printer will remain in this error state until the power is cycled or the unit is reset. If the problem persists, the printer will require service.

<u>MISSING BLACK INDEX MARK:</u> If the paper type selected is indexed paper, and while feeding paper or printing a black mark is not seen within approximately 10" of paper, then this type of error will occur. The purpose of this error is to alert 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. The condition is cleared by raising of the head release lever (presumably to change the paper).

PAPER JAM: This error indicates that the printer detected an error in the paper path for presenting the ticket to the customer. To clear this condition, open the printer head and inspect for a jammed ticket.

2.6 Paper Feed Operation

The printer has been designed to run with black mark indexed paper. Paper feeding is accomplished by use of the feed button. Each long press (~1 second) of the feed key will result in paper being advanced to the top of the next form.

2.7 Cut Key Functions

The CUT key performs no function in the PSA-66-ST printer and should be ignored.

2.8 Self Test

If the FEED key is held depressed during power up or reset, a self test will be triggered which will result in the proper printing of a configuration ticket if the test passes successfully. The test ticket is illustrated in

Figure **2-2** and it contains important information about how the unit is configured.

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 PSA-66-ST

Figure 2-2 Sample Configuration Ticket		
	Model: Firmware:	PSA-66-ST 2 4 0 0 0
Model number and software version	COMMUNICATION Interface: Baud Rate:	serial 19200
System communications setup	Data Bits: Parity: Handshaking: HARDWARE	8 NONE
	PRINT CONTROL Darkness Control: +00% Black Bar Index: Print On Demand: Disabled Auto Sleep Timer: Off	Disabled
	SYSTEM RESOURCES FLASH -Used: -Free:	000000 024064
	LIBRARY INVENTORY Templates: Print Regions: Graphics: Fonts: 3(0), 7(0)), 8(0), 5(0)

2.9 Clearing a Paper Jam

The printer has been designed to operate reliably with a minimum of paper jamming. Should it be necessary to clear a paper jam however, follow the simple instructions below. After the jam is cleared, perform these operations in reverse.

When clearing a paper jam:

DO:

- Insure that all paper paths from the entry point at the back of the paper well, through the printer and cutter and the presentation chute are clear of paper or obstructions
- Use the platen release lever located on the side of the unit
- Use the rotary screw at the top of the printer



DO <u>NOT</u>:

• Ever allow a screw driver or other probing object to come into contact with the printer; this can cause permanent damage

Undo the mechanism fastening screw at the top of the printer plate at the front of the printer:



Swivel the printer open. The paper path will be exposed, and any jammed paper can be removed:



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3 SERVICING THE PRINTER

Should the printer require service outside of the game, the sliding module which includes the majority of electronics may be easily removed and replaced. This chapter covers the sliding module removal operation.

3.1 Removing the Inner Module

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The sliding module of the PSA-66-ST may be removed from its stationary module by following the simple steps given below. To re-install the sliding module, repeat the steps in reverse order.



The printer is <u>**not**</u> hot-connectable and any attempt to do so can permanently damage the printer!



1 - turn off the power



Slide the unit open until it locks in the open position.



If you can access the ribbon cable which attaches the sliding module to the stationary module, go to the next step. If you cannot access the ribbon cable due to paper tray being in the way, grab the back of the paper tray by the back fin and rock it forward, pulling it out of the unit.





Release the ribbon cable by spreading the finger latches at the rear of the unit:



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Press in the release lever under the front of the sliding module to release the sliding printer module. The will release the locking mechanism and the unit may now be pulled completely out of the stationary module.

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4.1 Introduction

This section details the connector pin outs on the PSA-66-ST printer. There are actually two versions of the PSA-66-ST printer by part number are:

PSA-66-001N

Netplex Printer

And

PSA-66-ST

RS232 Printer

This section is divided into two sub-sections, one for each version of the printer.

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4.2 PSA-66-001N Netplex Printer

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PSA-66-001N Netplex Version



This table below lists information on the bezel port. The bezel port is for driving a printer front action alert light built into the front bezel.

Table 4-1 Front Bezel Port Pins

PIN	FUNCTION
1	Modulated +24VDC
2	No connect
3	GND

Figure 4-1 PSA-66-001N Front Bezel Port

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4.3 PSA-66-ST RS232 Printer

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PSA-66-ST RS232 Version



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Bezel Port

Γ,



Molex 39-01-4032 Molex 39-01-4030

The table below lists information on the bezel port. The bezel port is for driving a printer front action alert light built into the front bezel.

Connector:

Mate:

Table 4-4 Front Bezel Port Pins



Figure 4-4 PSA-66-ST Front Bezel Port

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Figure 4-7 PSA-66-ST RS232 Dip Switches Bottom View

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PSA-66-ST RS232 10 Position Dip Switch Settings

POS	FUNCTION		CONFIGURATION
1 2 3 4 5 6	Reserved	OFF off	these switches must always be left
7	INTERFACE SELECT !Note: this must be set for future compatibility	OFF ON	Not allowed RS232
8 9	COMMUNICATIONS PROTOCOL	9=OFF 8=OFF 9=OFF 8=ON 9=ON 8=OFF 9=ON 8=ON	illegal setting, do not use serial 38400,N,8,1 serial 9600,N,8,1 serial 57600,N,8,1
10	HANDSHAKING	OFF ON	XON/XOFF + RTS hardware handshake RTS hardware handshake only

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5 SENSOR OPERATION

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5.1 Paper Out Sensor

The paper out sensor is located within the pivoting printer head module and is used to terminate the print operation when paper has run completely out, and for proper form registration. The PSA-66-ST will cease printing and feeding operations once a paper out condition is detected. A paper out condition is corrected automatically by loading more paper to the unit.

5.2 Paper Low Sensor

The paper low sensor is located in the paper well, and is used to determine when the paper stack has approximately 30 tickets remaining. A paper low condition will be automatically reset once a stack with a greater height has been loaded. Paper low sensing only runs when the system is at idle and takes a few seconds to detect the new paper level.

5.3 Paper Present Sensor

The paper present sensor is located in the presentation chute of the unit and is used to determine when the customer has actually taken their cash-out voucher.

5.4 Paper Jam Sensing

The printer supports detection of a paper jam condition through use of the paper present sensor.

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6 APPENDIX **A** – General Specifications

 Table 6-1
 General Specifications

General Specifications

PRINTER	Dimensions	114mm width x 286mm depth x 68mm height*
	Weight	7 lbs
	Power requirements	24VDC @ 2.0A avg. (4.0A peak with 60% gaming ticket)
	Print head life	50km (320,000 tickets)
		*Using US currency size ticket
PRINTING	Method	Direct thermal, top coated, fan-folded and perforated
	Thickness	4.5 mil, 1 color/ 2 colors
	Width (mm)	62mm
	Storage	200, 400, 600, 800 and 1000 tickets depending on ticket tray
	Ticket trays	Interchangeable. 200, 400, 600, 1000 ticket tray with quick release bar
SPECIFICATIONS	Print Speed	75mm/second (3 inches per second)
	Complete Print and Present	2.2 seconds
	Print Resolution	8 dots / mm (203 dpi)
		Application completely in-circuit re-programmable (via Flash)
	Self test	Yes
	Bezel Control	Two high current lighting control ports
PAPER	Loading	Automatic hands free
	Paper feed	Manual
	Width	66mm (dollar bill size)
	Length	156mm (dollar bill size)
	Sensors	Paper low sensor
		Paper out sensor
		Printer drawer open sensor
		Ticket taken sensor
		Ticket jam sensor
		Ticket in chute sensor
		Black Mark sensor
		Host controllable buzzer
CHARACTERISTICS	Fonts	4 (5.5 cpi, 7.5 cpi, 10 cpi, 20 cpi)
	Font Scale-ability	May be independently scaled from $1x - 7x$ in both height and width
	Barcodes	Interleaved 2 of 5, Code 39, UPC-A, UPC-E, UPC-E+2, UPC-E+5, Codabar, EAN-13, EAN-8, Code 128, MSI
	Data buffer	8K
	Memory	256K Flash & 128K Ram
	Bezel Control	2 high current Ticket Printing bezel control ports

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General Specifications

PRINT MODES	Printer languages	TCL page description language
		Subset of ESCP2 printer language
	Page mode	Full page mode printing (simultaneous 4 orientation printing: 0°, 90°, 180°, 270°)
		Line and box draw printer resident
OTHER		Bitmap Graphics
		PCX printer resident (stored in Flash) graphics
		Line and box draw printer resident
INTERFACE		Bi-Directional RS232C, full handshaking set
		Netplex
PHYSICAL CHARACTERISTICS	Dimensions	114mm W x 286mm D x 68mm H
	Weight	7 lbs
ENVIRONMENTAL	Operating temperature	-5°C to 50°C
	Storage temperature	-20ºC to 85ºC
	Operating humidity	5 to 95% RH
RELIABILITY	Maintenance	No user maintenance required
		Printer completely removable with quick release bar
	Print Head Life	50km minimum (320,000 tickets)



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8 APPENDIX \mathbf{C} – PRINTER PART NUMBERS

Table 8-1 Printer Order P/N's

DESCRIPTION	PART NUMBER
PRINTER, NETPLEX*	PSA-66-001N
PRINTER, RS232	PSA-66-ST
PRINTER, TRAY, 200TKTS	PSA-66-200-TRAY
PRINTER, TRAY, 400TKTS	PSA-66-400-TRAY
PRINTER, TRAY, 600TKTS	PSA-66-600-TRAY
PRINTER, TRAY, 1000 TKTS	PSA-66-1000-TRAY

* Netplex equipped printers meet the Netplex specification of International Game Technology Corporation

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9 APPENDIX **D** – SPARE PARTS

For ordering spare parts, refer to the drawings and tables below.

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Table 9-1 Spares P/N's

Printer	
DESCRIPTION	PART NUMBER
STATIONARY UNIT, CHASSIS ONLY ASSEMBLY	SPK-66-ST-01
SLIDING UNIT, CHASSIS ONLY ASSEMBLY	SPK-66-ST-02
STATIONARY MODULE, COMPLETE WITH ALL PARTS, NETPLEX	PSA-66-ST-580011
SLIDING MODULE, COMPLETE WITH ALL PARTS, NETPLEX	PSA-66-ST-580012
STATIONARY MODULE, COMPLETE WITH ALL PARTS, RS232	PSA-66-ST-580013
SLIDING MODULE, COMPLETE WITH ALL PARTS, RS232	PSA-66-ST-580014
200 TICKET TRAY	PSA-66-200-TRAY
400 TICKET TRAY	PSA-66-400-TRAY
600 TICKET TRAY	PSA-66-600-TRAY
1000 TICKET TRAY	PSA-66-1000-TRAY
THERMAL PRINTER MECHANISM	LTP-2342J-S496
PCB, MOTHERBOARD, NETPLEX FIRMWARE	SPK-66-ST-07
PCB, DAUGHTERBOARD, NETPLEX	SPK-66-ST-08
PCB, MOTHERBOARD, RS232 FIRMWARE	SPK-66-ST-18
PCB, DAUGHTERBOARD, RS232	SPK-66-ST-17
PCB & CABLE, PAPER LOW ASSEMBLY	SPK-66-ST-09
CABLE, RIBBON, 50PIN TO 50PIN	SPK-66-ST-10
CABLE, DEDICATED NETPLEX COMMUNICATIONS AND BEZEL PORT	PSA-66-DN-CABLE
CABLE, RS232 COMMUNICATIONS AND BEZEL PORT	PSA-66-RS232-CABLE
CABLE, FRONT BEZEL PORT	SPK-66-ST-12
CABLE ASSEMBLY, TICKET TAKEN	SPK-66-ST-13
MEMBRANE CONTROL PANEL	SPK-66-ST-14
CHASSIS FASTENERS HARDWARE KIT	SPK-66-ST-15
SPRING, "W" SHAPE, BULK BAG, 96 PCS/BAG	SPK-66-ST-19
SPRING, EXTENSION, BULK BAG, 96 PCS/BAG	SPK-66-ST-20
SPRING, FLAT, BULK BAG, 192 PCS/BAG	SPK-66-ST-21

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Bezels	
DESCRIPTION	PART NUMBER
BEZEL ASSEMBLY 1/" UPRIGHT	PSA-66-ST-652241
BEZEL SLANT (BEZEL ONLY)	PSA-66-ST-646021
BEZEL ASSEMBLY SLANT	PSA-66-ST-646023
BEZEL VISION UPRIGHT & SLANT (BEZEL ONLY)	PSA-66-ST-581405
BRACKET, BEZEL, 17" UPRIGHT	PSA-66-ST-626289
BRACKET, LED, VISION UPRIGHT	PSA-66-ST-626292
PCB ASSEMBLY, VISION UPRIGHT	PSA-66-ST-751226

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Netplex is a proprietary hardware interface and protocol which is the property of International Game Technology Corporation.

TCL Printer Language is a proprietary copyrighted language which is the property of Futurelogic, Inc.