

# PAYCHECK<sup>®</sup> NEXTGEN<sup>™</sup>

PayCheck<sup>™</sup> NextGen

## *Technicians Manual*



August 29, 2022  
Document # 720009-0000R

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#### Warning

Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

#### Note

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

## **Information to the User**

This equipment must be installed and used in strict accordance with the manufacturer's instructions. However, there is no guarantee that interference to radio communications will not occur in a particular commercial installation. If this equipment does cause interference, which can be determined by turning the equipment off and on, the user is encouraged to contact Nanoptix Inc. immediately.

Nanoptix Inc. is not responsible for any radio or television interference caused by unauthorized modification of this equipment or the substitution or attachment of connecting cables and equipment other than those specified by Nanoptix Inc. The correction of interferences caused by such unauthorized modification, substitution or attachment will be the responsibility of the user.

In order to ensure compliance with the Product Safety, FCC and CE marking requirements, you must use the power supply, power cord, and interface cable, which were shipped with this product or which meet the following parameters:

### **Power Supply**

UL Listed power supply with standard 60Hz-50Hz, 100-240VAC input and 24VDC output equipped with AC line filtering, over-current and short-circuit protection.

Use of this product with a power supply other than the Nanoptix Inc. power supply will require you to test the power supply and Nanoptix Inc. printer for FCC and CE mark certification.

### **Communication Interface Cable**

An approved Nanoptix interface cable must be used with this product. Use of a cable other than Nanoptix approved product will require that you test the cable with the Nanoptix Inc. printer and your system for FCC and CE mark certification.

### **Power Cord**

A UL listed, detachable power cord must be used. A power cord with Type SVT marking must be used. For applications outside North America, power cords that meet the particular country's certification and application requirements should be used.

Use of a power cord other than described here may result in a violation of safety certifications that is in force in the country of use.

## **Industry Canada (IC)**

### **Radio Frequency Interference Statement**

This Class B digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

*Cet appareil numérique de la classe B respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.*

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## About the Printer

### 1.1 Description of Printer

The Nanoptix PayCheck™ NextGen is extremely fast, quiet, and very reliable. With thermal printing technology, there is no ribbon cassette to change, and paper loading is extremely simple. The printer is small enough to fit almost anywhere and is easy to use with the ticket exiting from the front.



**Figure 1: Nanoptix PayCheck™ NextGen Printer**

## 1.2 General specifications

<b>Print Method</b>	Direct Thermal
<b>Resolution</b>	8 dot/mm (203 dpi)
<b>Print Width</b>	64mm
<b>Paper Width</b>	65mm
<b>Cartridge Size</b>	400, 600, 800
<b>Operating Temperature</b>	0° to 60° C
<b>Storage Temperature</b>	-20° C to 75° C
<b>Operating Relative Humidity</b>	5% to 90% RH at 50C (non-condensing)
<b>Communication Interface Options</b>	2 Bidirectional RS-232C 3 USB 2.0 high-speed host ports 2 USB 2.0 high-speed device ports (1 for maintenance) HDMI output port, 720p Ethernet Port Micro SD Card Reader
<b>Memory/Firmware</b>	32 Gbit Flash, 4 Gbit Ram & 16 kbit EEPROM
<b>Resident Character Sets</b>	Support 32 fonts Approx. (16 resident 16 user defined)
<b>Integrated Bar Codes</b>	UPC-A, UPC-E, Interleaved 2 of 5, Code 39, Code 93, Codabar, EAN 8, EAN 13, Code 128. Note: other barcodes can be programmed quickly
<b>Speed</b>	Up to 200 mm (7.9 in.) per sec. (monochrome) Up to 125 mm (5 in.) per sec. (two-color mode)
<b>Sensors</b>	Last sheet paper low, adjustable paper low, paper out, ticket taken, drawer open, cover open, ticket jam
<b>Duty Cycle (max.)</b>	5 tickets per minute
<b>Human Interface</b>	Drop-in paper loading, status LEDs, paper feed button
<b>Dimensions</b>	65mm width x 112mm height x 286mm depth
<b>Weight</b>	0.57 Kg (1.25 lbs)
<b>Immunity</b>	EN 55024 Information Technology Equipment
<b>Emission Standards</b>	United States - FCC Part 15 Subpart A Canada - Industry Canada ICES-003 Europe – EN 55022 Class A emissions Information Technology Equipment
<b>Safety</b>	QPS Certified Control Number: LRE1123

**Table 1: Specifications**

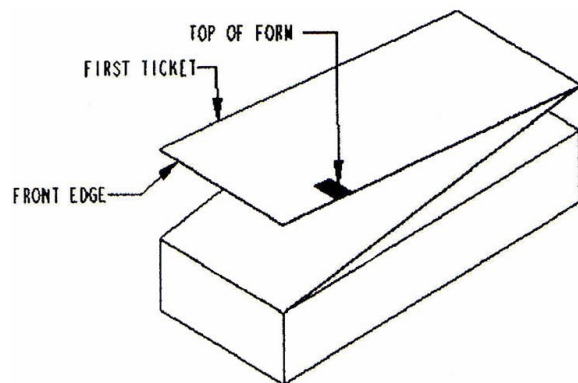


## 1.3 Paper Loading

The paper stack should be changed when it is low or out.

**Caution:** The printer will not operate without paper, but it may continue to accept data from the host computer. Since the printer cannot print any transactions, the data may be lost.

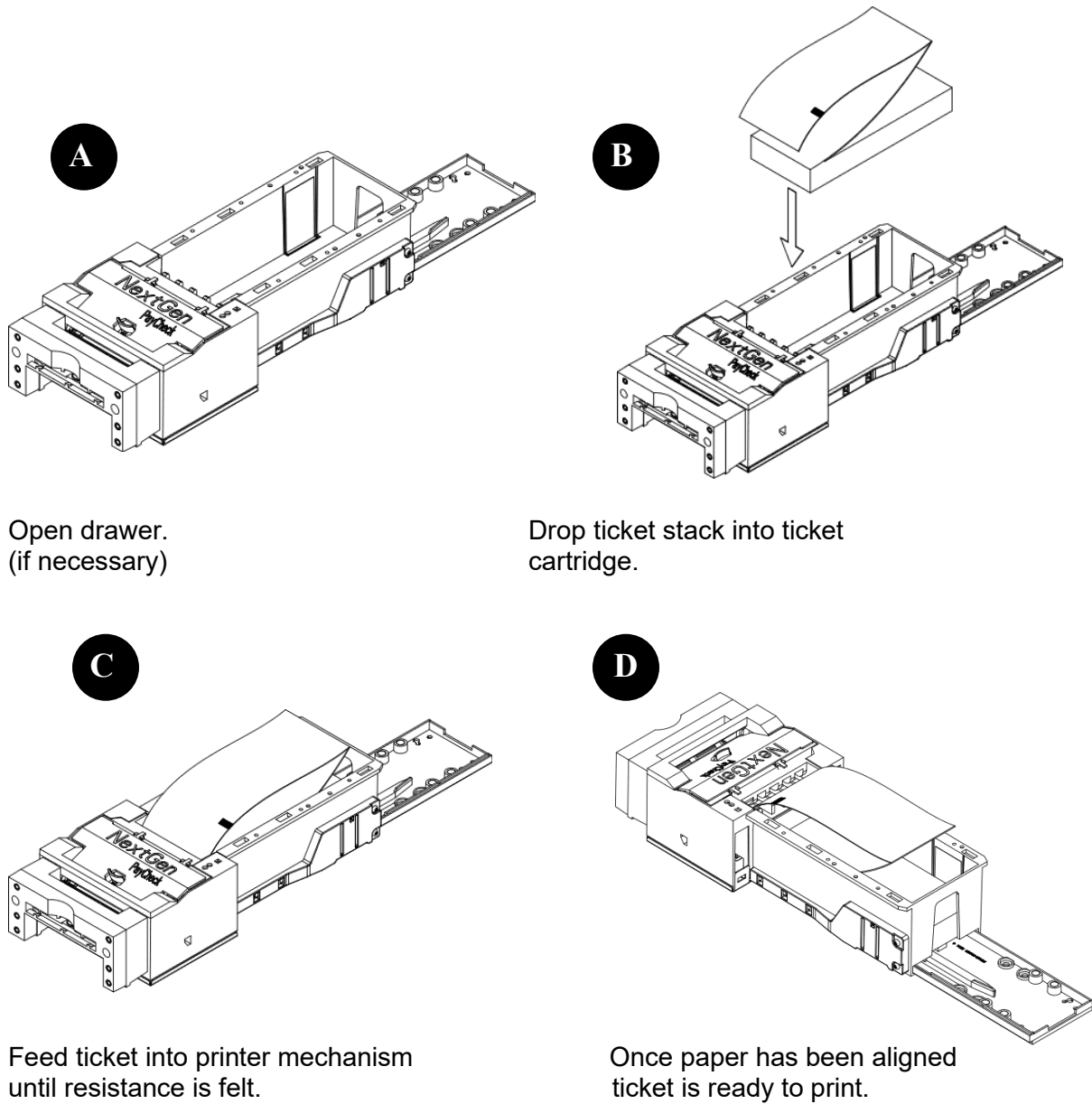
The maximum stack that will fit in the ticket cartridge is 400, 600 or 800 tickets depending on the cartridge option that was purchased with the printer.



Ticket stack orientation:

The stack must be oriented so that its top of form mark is on the leading edge of the ticket.

**Figure 2: Ticket Stack Orientation**



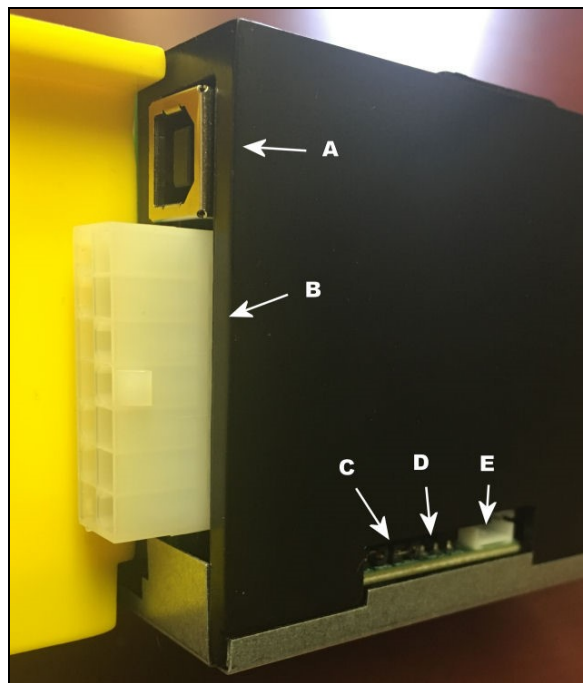
**Figure 3: Loading Paper**

## 1.4 Printer Interface

Identifier	Type	Function
<b>A</b>	USB type B	USB communication
<b>B</b>	14 pin "Molex mini fit"	Power & dual serial communication
<b>C</b>	Left jumper	Connects pin 5 to Pin 7 & 10 on port B
	Right jumper	Bezel control connected to pin 9 of port B
<b>D</b>	Switch left position	Port B Aux port Netplex
	Switch right position	Port B Aux port RS232
<b>E</b>	3 pin "JST PE"	Debug

Note: For ESD protection, the left jumper must be installed when switch D is set to Netplex

**Table 2: Interface - left**



**Figure 4: Interface – left**

Identifier	Type	Function
<b>F</b>	USB type A	USB communication (expansion)
<b>G</b>	RJ45	802.3 Network interface
<b>H</b>	Micro HDMI	Video, etc.

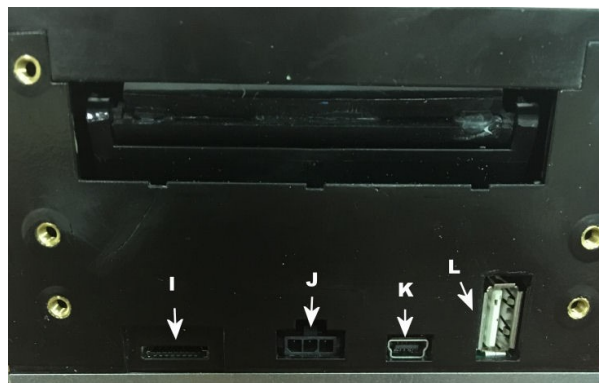
**Table 3: Interface - right**



**Figure 5: Interface – right**

Identifier	Type	Function
<b>I</b>	SD media card interface	MicroSD
<b>J</b>	Molex microfit 3.0	Bezel illumination
<b>K</b>	Mini USB type B	maintenance
<b>L</b>	USB type A	USB communication (expansion)

**Table 4: Interface – front**

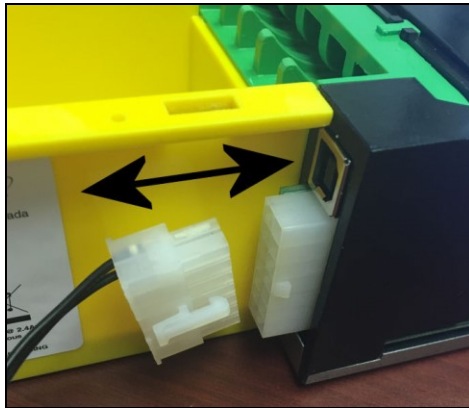


**Figure 6: Interface - front**

## 1.5 Printer Controls

### 1.5.1 Printer Reset (Service use only)

The printer is reset by disconnecting and reconnecting the power/communication cable. Once connected, the printer goes through a startup routine and resets itself.



**Figure 7: Printer Reset**

### 1.5.2 Paper Feed Button

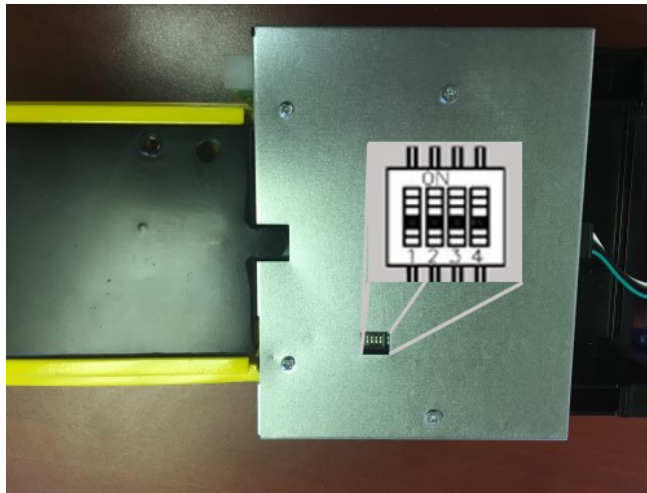
The paper feed button is used to advance the paper. Once the ticket removed, the printer will realign the paper to the ready position.



**Figure 8: Paper Feed Button**

### 1.5.3 DIP switches

The DIP switch is available through the access hole of the bottom plate.



**Figure 9: DIP Switch**

Identifier	Position	Function
1	ON	Recovery mode
	OFF (default)	Run mode
2	ON or OFF (default)	Spare
3	ON or OFF (default)	Spare
4	ON (default)	Watchdog enabled
	OFF	Watchdog disabled

**Figure 10: DIP Switch**

## 1.5.4 LED

Two LEDs provide visual feedback of the operation of the printer.



**Figure 11: LED Positions**

Error LED (Red)	Status LED (Green)	Condition
OFF	ON	Printer Ready
ON	OFF	Paper Out
MED BLINK	OFF	Temperature Error
SLOW BLINK	OFF	Voltage Error (Over 26.2 VDC)
FAST BLINK	ON	Print Head Error
FAST BLINK	ON	Missing Black Index Mark
FAST BLINK	ON	Paper Jam

**Table 5: LED Information**

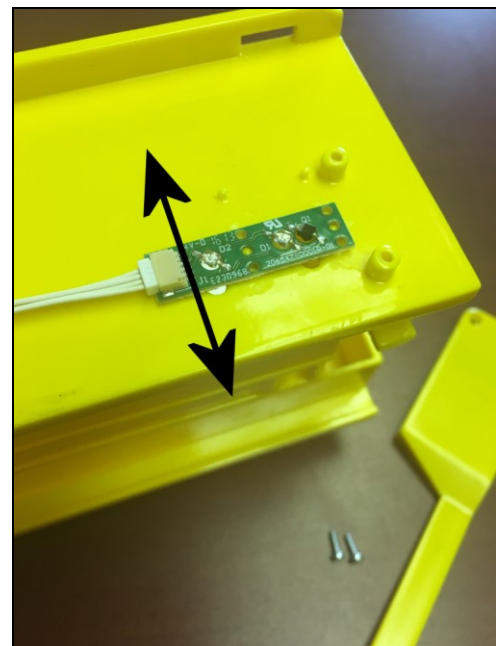
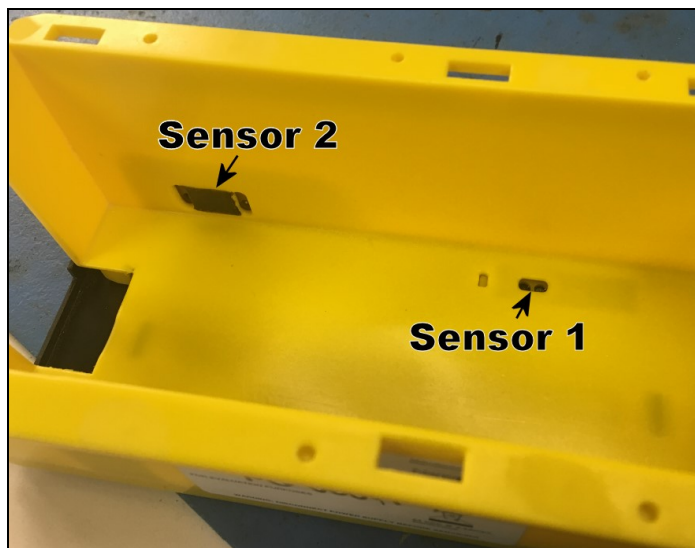
## 1.5.5 Paper Low

There are 4 paper low detection options. Paper low sensor 1 is only used when paper low sensor 2 is in the off position.

Detection quantity (sheets)	Paper low 2 position
1	OFF
50	HIGH
35	MEDIUM
15	LOW

**Table 6: Paper low**

To change the paper low detection quantity. Turn the printer on its left side and remove the sensor cover. Using the alignment pins, place the sensor in the desired position. Then reinstall the sensor cover



**Figure 12: Paper low**



## 1.6 Testing the Printer

### 1.6.1 Configuration Ticket

This test can be used to verify the correct operation of the printer. The test prints a resident ticket listing the current printer settings. This ticket can also be used to verify printing quality. To print the test ticket, the printer must be powered "ON" while holding the paper feed button for approximately 5 seconds. A status ticket similar to below will be printed. Pressing the button again will result in blank tickets.

```

Model:                PAYCHECK NextGen
Firmware:             NPG-9.99Z (0x6D00)
Printer Driver Ver:   1.0.1.1
SETTINGS
COMMUNICATION
  Protocol:           NTL
  Interface:          Serial
  Serila Settings:    9600,8,NONE
  Handshaking:        XON + RTS
  Print mode:         Page
NETWORKING
  eth0                99.99.99.201
PRINT CONTROL
  Speed:              200 mm/sec
  BurnTime:           300 uS
  Motor Current:      58%
PRINTER ENVIRONMENTAL CONDITIONS
  Voltage:            24.7 Volts
  Temperature:        25 Celcius
SYSTEM RESOURCES
  FLASH Used=00000
  Free=65535
LIBRARY INVENTORY (Satandard)
  Tpl: 0, 1, 2, 4, 4, 5,6,7,8,9,A,B
  Rgn 1, 2, 3, 4, 5, 6, 7, 8, h, 9, A, B, C, D, E, F,
      G, I, J, K, L, N, O, P, Q, R, S, T, U, Z, X, a,
      b, c, d, e, f, g, I, j, k, l, m, n, o, p, q
  Gfx:
LIBRARY INFORMATION
  Board:              209022-0001R-04
  Board ID:           5P00122
  Printer ID:         NG0003C
  Date Code:          20160505

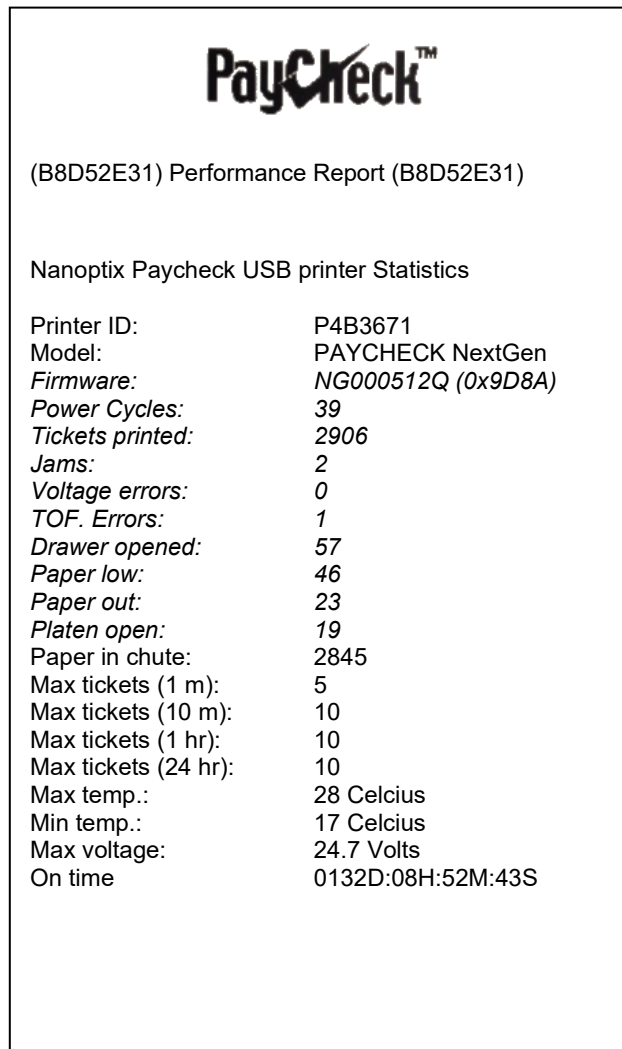
*S|0|PAY-4.82H|@|@|@|@|P|*
    
```

**Figure 13: Sample Test Ticket**

## 1.6.2 Printer Performance Metrics

(not implemented in all firmware versions)

This ticket lists the performance metrics recorded by the printer since the printer was installed. The test prints a resident ticket listing various errors and status. To print this ticket, the printer must be turned "ON" and operating in normal "Run Mode". Press and hold the paper feed button for approximately 5 seconds. A performance ticket similar to below will be printed.



**Figure 14: Sample Metrics Ticket**

## 1.7 Clearing Jams

The Nanoptix PayCheck NextGen printer's paper guide and printing mechanism roller are easily removed, giving full access to the paper path.



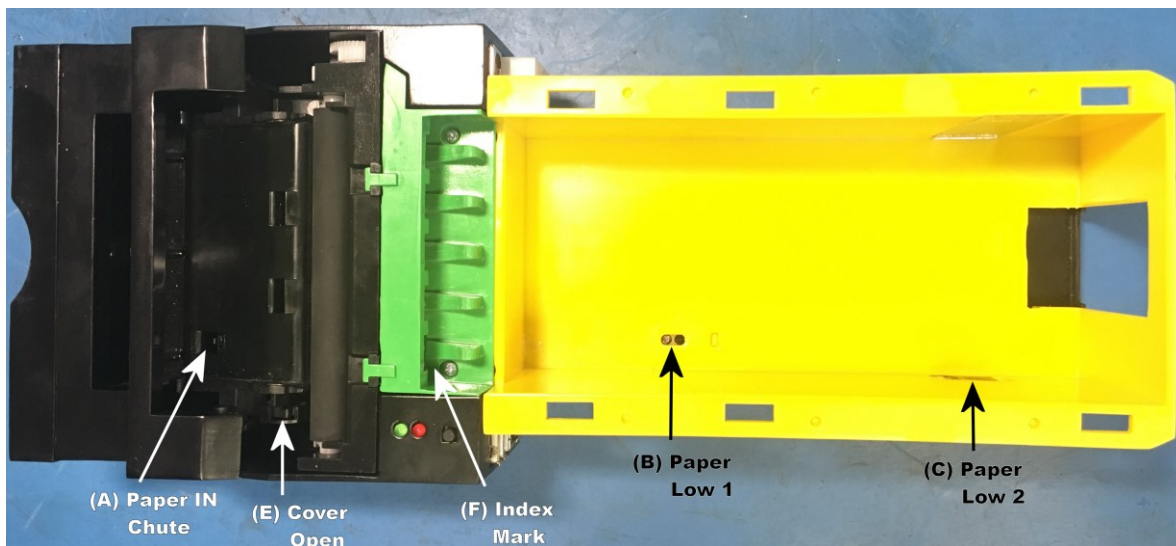
**Figure 15: Clearing Jams**

## 2 Troubleshooting the Printer

### 2.1 Basic Printer Operation

Although the Nanoptix PayCheck™ printer is a complex device, its operation is fairly simple. The printer requires two consumables to operate, (1) a regulated 24 VDC power source and (2) approved thermal paper. The printer is equipped with eight communication interface ports

The printer is mounted using a sliding baseplate. This baseplate's home position is detected by a magnetic sensor. A reflective optical sensor (B) situated in the bottom of the ticket tray is used to detect the last sheet of paper. In order to do this, the paper low sensor (C) must be installed in "disable" position. This paper low sensor (C) has 3 other mounting positions used to trigger a paper low condition at varying amounts of paper left in the tray. A third optical sensor (F) is used in the printing mechanism assembly to detect the presence of paper and start the feeder motor when loading paper. This sensor also works in conjunction with a fourth optical sensor (A) situated in the paper chute to realign paper back to its "ready" position.



**Figure 16: Sensors**

Identifier	Function
A	Paper in chute
B	Paper low 1 (single sheet)
C	Paper low 2 (3 height options)
D	Printer closed (under bracket)
E	Cover open
F	Index (Top of form)

**Table 7: Bezel Interface**

## 2.2 Communication Cables Pin-Out

### 2.2.1 Universal Communication interface

The table below describes the connection pin-out for the Universal Interface (14-pin “Molex” type)

Pin	Signal Name	Printer I/O	Host I/O	Printer Function
1	Reset	Input	Output	Resets Printer
2	PRT_AUX_RXD	Input	Output	Auxiliary Receive
3	VAUX	Input	Output	Auxiliary Power
4	PRT_AUX_TXD	Output	Input	Auxiliary Transmit
5	AUX_Ground (See note 1)	Signal / Frame Ground	Signal / Frame Ground	Signal / Frame Ground
6	24V	Power Input	n/a	Power Input
7	Signal / Frame Ground	Signal / Frame Ground	Signal / Frame Ground	Signal / Frame Ground
8	24V	Power Input	n/a	Power Input
9	Bezel_pwm (See note 2)	24V Output	n/a	Bezel Driver
10	Signal / Frame Ground	Signal / Frame Ground	Signal/ Frame Ground	Signal/ Frame Ground
11	PRT_RS232_RXD	Input	Output	Data Receive
12	PRT_RS232_TXD	Output	Input	Data Transmit
13	PRT_Status	Output	Input	Printer Ready
14	PRT_RS232_RTS	Output	Input	Handshake

Note 1: Pin 5 is isolated from pin 7 & 10 unless ground jumper is present

Note 2: Bezel illumination control jumper must be present for bezel modulation to be present on pin 9

**Table 8: 14 Pin RS232 Serial Interface**

### 2.2.2 Illuminated bezel interface

The table below describes the connection pin-out for the front Bezel Connector (3-pin “Molex” type).

Pin	Signal	Printer I/O
1	Bezel PWM	Output
2	24VDC	Output
3	GND	GND

**Table 9: Bezel Interface**

## 2.3 Printing Problems

The table below can be used to determine the cause and resolution of the most common problems that may occur. If the information in this section does not correct the problem, contact a Nanoptix service representative.

Problem	Possible Causes	What to Do
Printer Does Not Function When Turned On	Printer not plugged in	Check that printer cables are properly connected at both ends Check that the host and power supply are getting power
	Tray not fully closed	Close the tray
	Flat cable incorrectly or not fully inserted into the receptacle	Fully insert the flat cable in the into the receptacle at both ends
Paper jam	Paper width out of specification	Test paper width for compliance
	Debris or partial ticket stuck in the paper path	Open paper guide and detach roller, remove debris
	Paper's perforation burst strength out of spec	Test paper perforation for compliance
Noisy Feeder Motor (paper disengaged)	The printer is meant to be operated with paper engaged in the printing mechanism, failing to do so will cause gears to grind and slip, noise may result	Do not operate printer without any paper engaged in the printing mechanism Note: <u>Never</u> lubricate gears or any other part of the printer
Paper does not realign itself when a ticket is printed	Paper's alignment mark, (which is the black dot printed on the non-sensitive side of thermal paper) may be out of specification	The maximum reflectance of the alignment mark is 15% (infrared). Simply put, this means that the alignment mark's color should be an even/crisp black. If any white or gray is visible, it is an indication that the reflectance could be more than 15%
Line of print or section missing lengthwise on the entire ticket	Paper's thermal coating inconsistent	Change the paper stack to make sure the thermal coating is not the source
	Thermal printing mechanism damaged	Contact a customer service representative
The print is light or spotty	The thermal print head is dirty	Clean the print head by following the recommended procedure (Section 6)
	Paper's thermal coating inconsistent	Change the paper stack to make sure the thermal coating is not the source

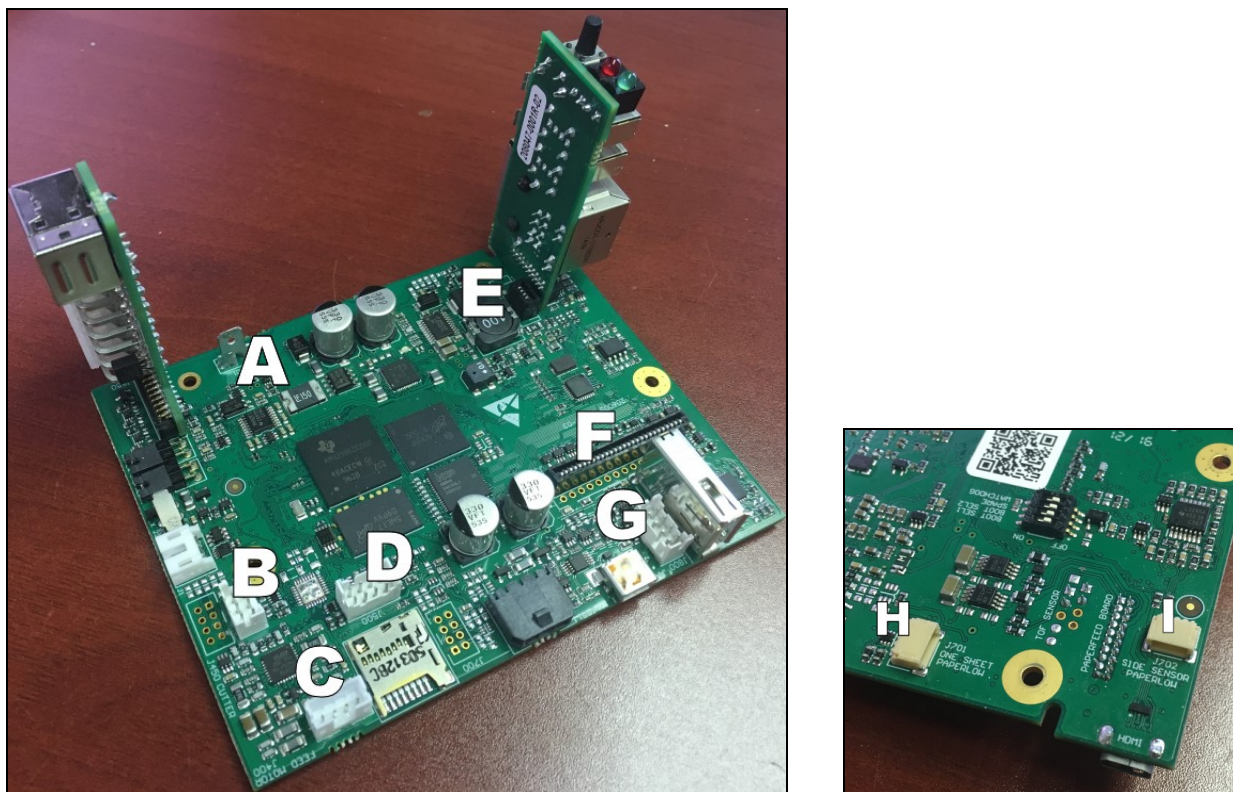
**Table 10: Troubleshooting Printing Problems**



## 2.3.1 Main Controller PCB Connector Layout

A	J301	TPH grounding tab
B	N/A	Future
C	J401	Feeder motor
D	J500	Future
E	J600B	Index (Top Of Form)
F	J300A	Thermal print head
G	J800	Paper-in chute sensor & cover closed
H	J701	Paper low – one sheet
I	J702	Paper low – 3 side options

**Table 11: Connector Functions**



**Figure 17: Connector Layout**

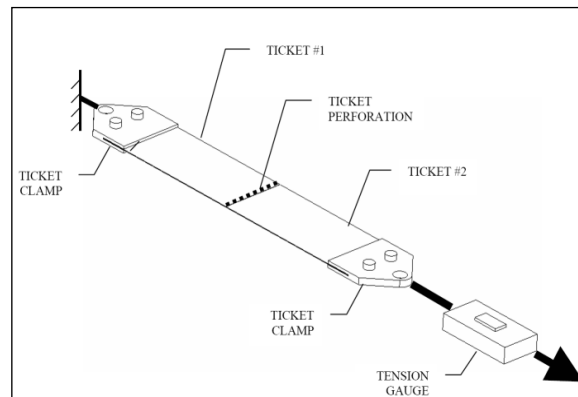
## 3 Media and Supplies Guide

### 3.1 Thermal Paper Specifications

NOTE: Qualified thermal paper with the following specifications is required for proper operation.

<b>Width</b>	65 mm +/-1 (2.56 IN)
<b>Length</b>	156 mm +/- 1 (6.14 IN)
<b>Thickness</b>	4.5 +0.1 -0.3 mil
<b>Brightness</b>	89%
<b>Smoothness</b>	2000 sec Avg.
<b>Perforation burst strength</b>	1.3 +/- 0.4 LBS (0.59 +/- 0.18 Kg.
<b>Alignment Mark (TOF)</b>	Optical Density of 1.10 min.

**Table 12: Paper Specifications**



**Figure 18: Perforation Test**



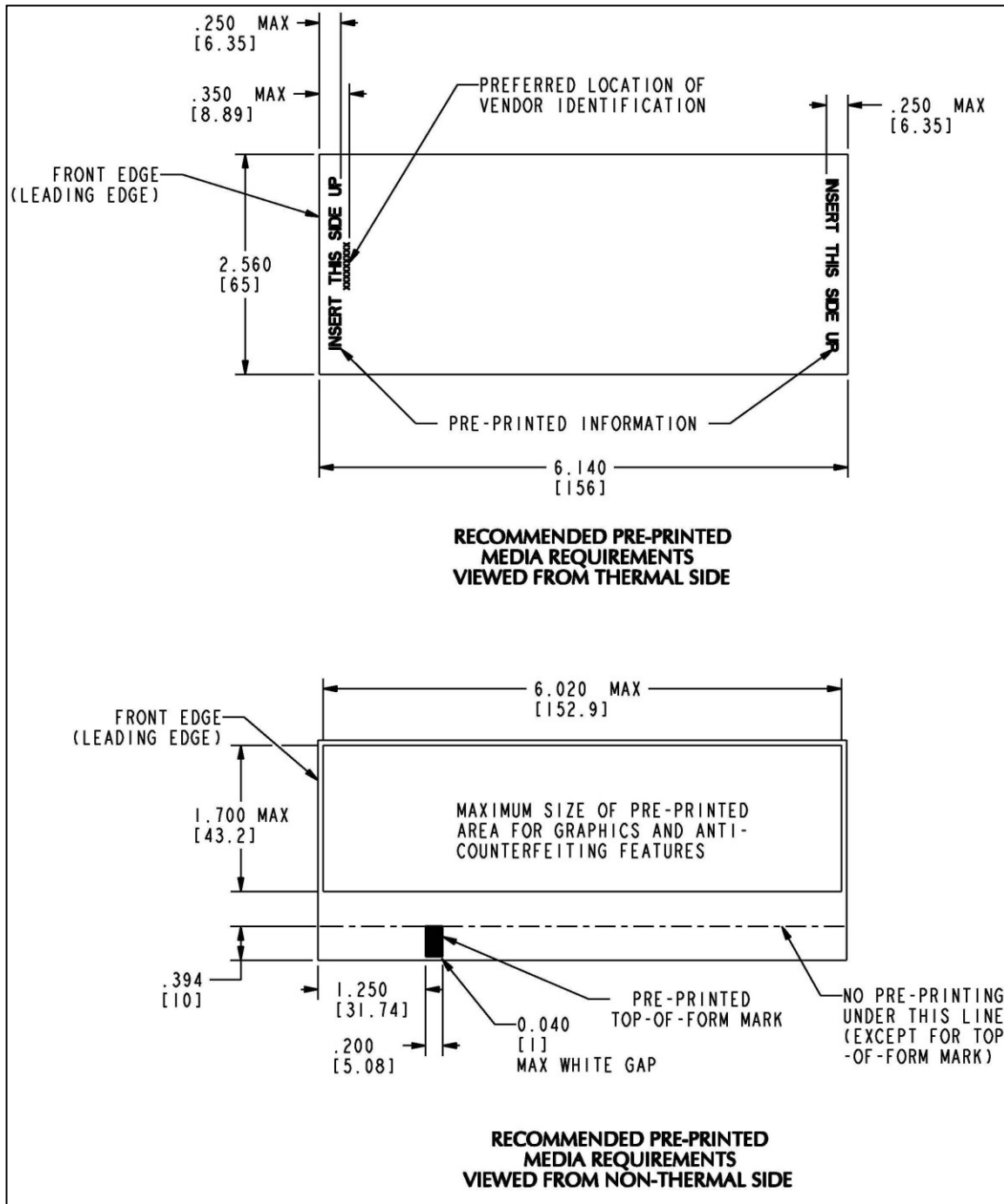


Figure 19: Ticket Specifications

## 3.2 Ordering Thermal Paper

The following paper grade produced by Appvion and Kanzaki Specialty Papers are recommended by Nanoptix. There are a number of paper converters qualified to supply this paper, provided they use the recommended grades listed in Table 13.

Paper qualification services are offered by Nanoptix for additional grades not listed below.

Manufacturer	Numbers	Nanoptix part no.	Paper Grade
<b>Appvion Papers</b>	Tel:920-991-8438	100505-3024R (200 stack) 100505-3025R (400 stack) 100505-3026R (600 stack) 100505-3027R (800 stack)	Royale 800-4.5
<b>Kanzaki Specialty Papers (USA)</b>	Tel:888-526-9254 Fax: 413-731-8864	100505-3012R (200 stack) 100505-3013R (400 stack) 100505-3014R (600 stack) 100505-3015R (800 stack)	TO-381-N
<b>KANZAN Spezialpapiere GmbH</b>	Tel: +49 2421 5924-0 Fax: +49 2421 5924-19	N/A	Kanzan KL 69

**Table 13: Ordering Thermal Paper**

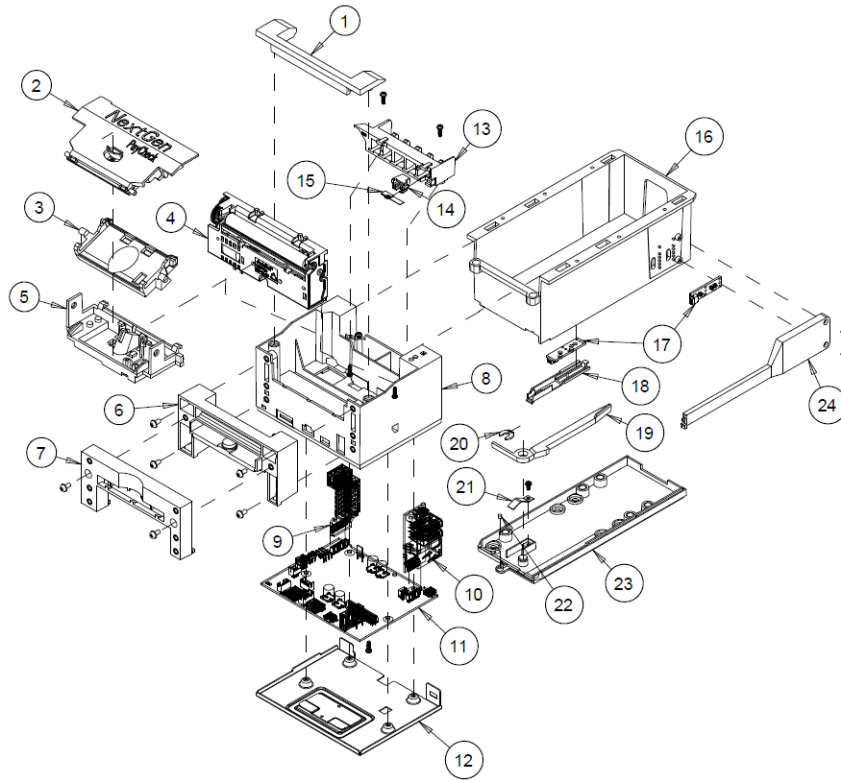
## 3.3 Ordering supplies & cables

Contact your sales representative to order the communication cables listed in the table. The numbers are for reference only. Suppliers may use other numbers.

Part	Part Number
Power supply, 24 VDC	213005-0012R
Power cord (North America)	102080-0000R
Power cord (Europe)	102080-0001R
RS232 communication cable (14-Pin "Molex" type to DB-9)	210036-0004R
Second RS232 port, In-Line Cable	210036-0003R
USB Cable 2M (A to B)	100390-0001R

**Table 14: Ordering supplies**

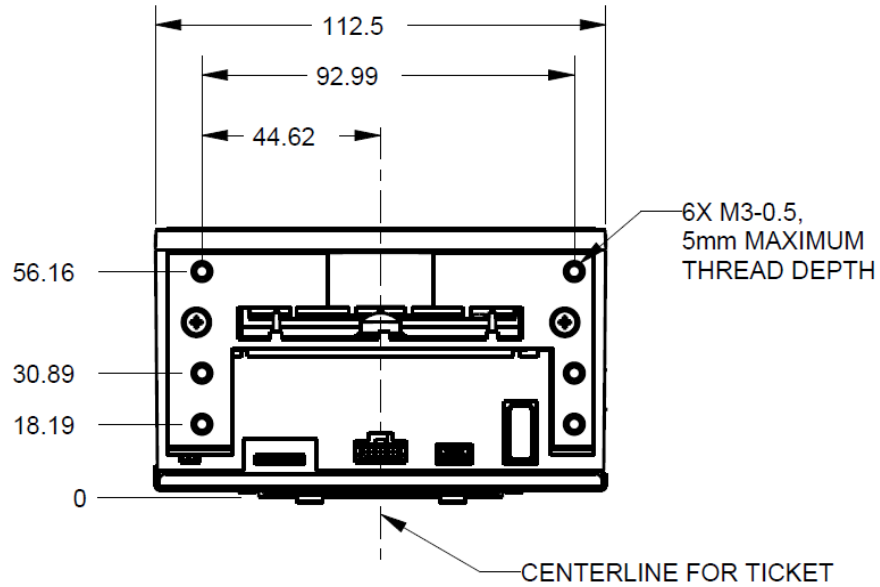
## 3.4 Parts List



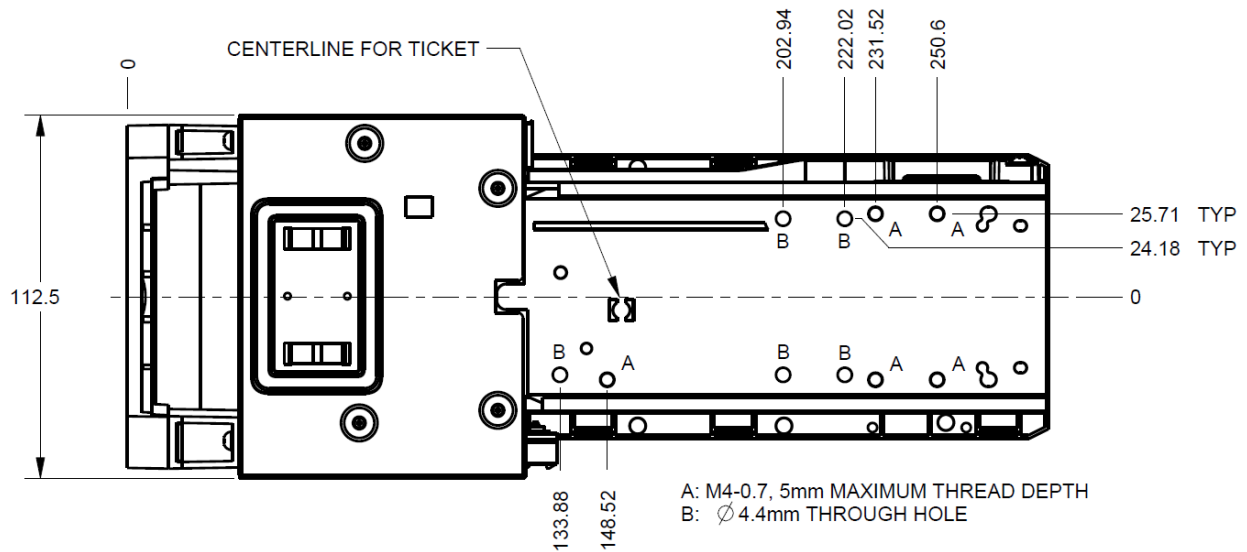
ITEM #	DESCRIPTION	QTY
1	HANDLE	1
2	TOP CHUTE COVER	1
3	BOTTOM PAPER GUIDE	1
4	PRINT MECHANISM	1
5	BOTTOM CHUTE HOLDER	1
6	BASE WITH ANTI-JAM	1
7	FRONT ANTI-JAM MODULE	1
8	FRAME	1
9	POWER BOARD	1
10	PAPER FEED BOARD	1
11	MAIN BOARD	1
12	BOTTOM COVER	1
13	MECH MOUNT	1
14	TOF SENSOR HOLDER	1
15	TOP OF FORM BOARD	1
16	TRAY	1
17	PAPER LOW BOARD	2
18	PAPER LOW HOLDER	1
19	LATCH	1
20	RETAINING RING	1
21	LOCKING SPRING	1
22	MAGNET	1
23	BASE	1
24	SIDE PAPER LOW COVER	1

**Figure 20: Part List**

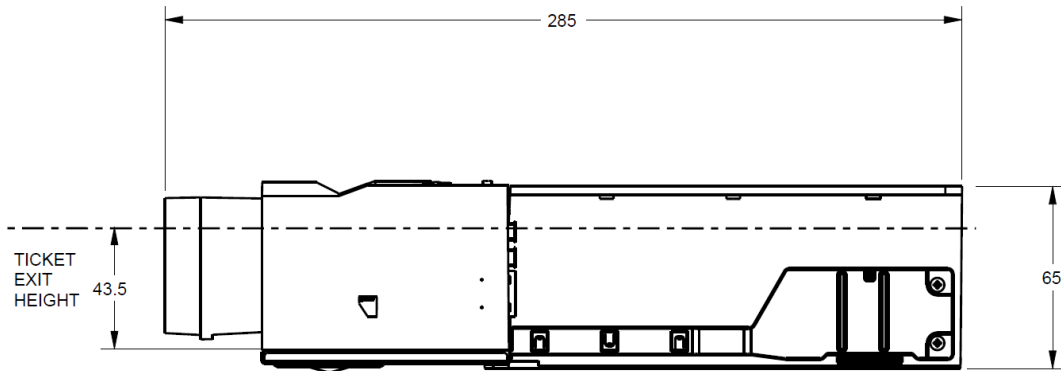
## 3.5 Mechanical Drawings



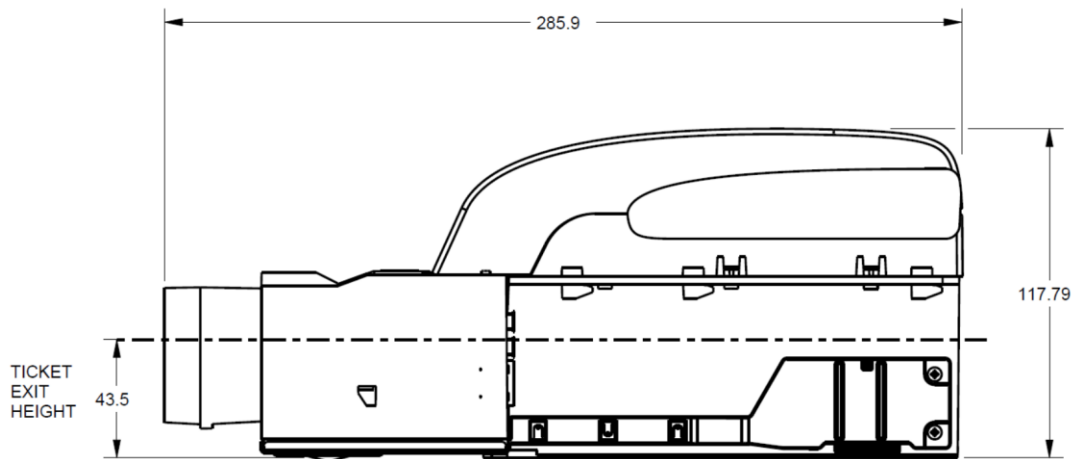
**Figure 21: Dimensions - Front**



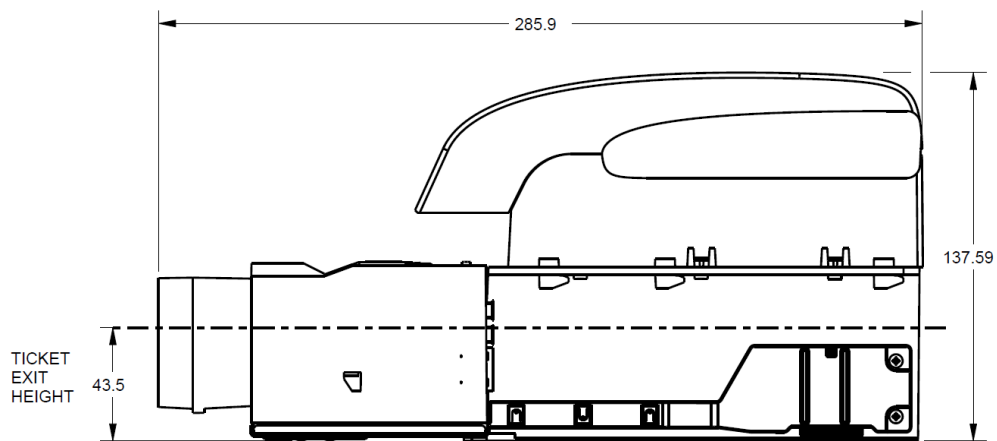
**Figure 22: Dimensions - Bottom**



**Figure 23: Dimensions – Right side (no ticket extension)**



**Figure 24: Dimensions – Right side (600 ticket extension)**



**Figure 25: Dimensions – Right side (800 ticket extension)**

## 4 Spare parts replacement instructions



Use ESD protection (such as a wrist strap) anytime a PCB is exposed



### Instruction A: Removal of the printer from the mounting bracket

1. Pull printer forward until resistance is felt, then move green lever all the way to the left
2. Pull printer further forward to separate from mounting bracket

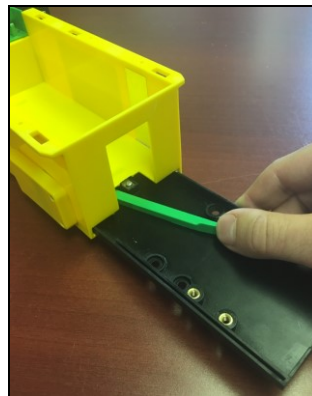


Figure 26: printer mount

### Instruction B: Removal of jam proof module

1. Remove 2 screws to remove the outer jam proof module
2. Remove 6 screws to remove the inner jam proof module

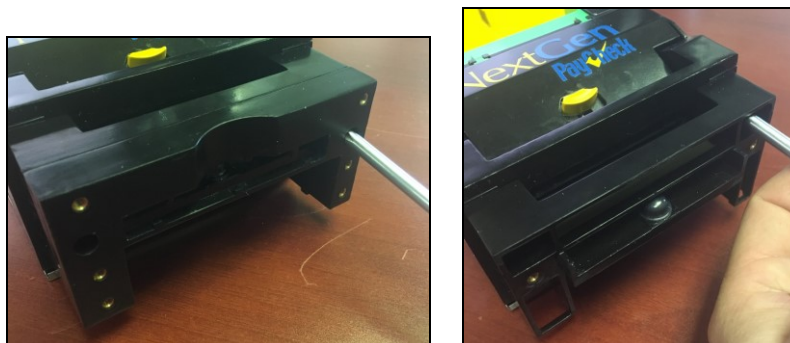


Figure 27: Jam Proof module

## Instruction C: Removal of the base plate

1. Remove 4 screws then lift up to remove the baseplate

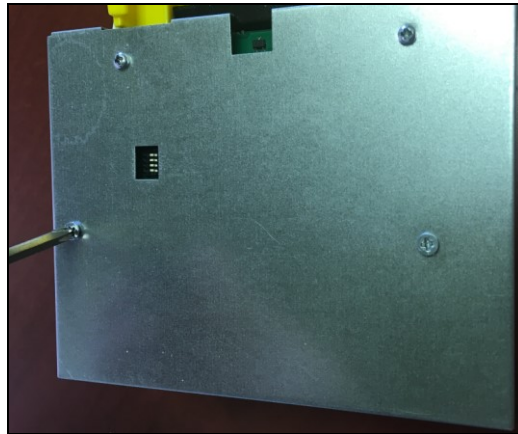


Figure 28: Base Plate

## Instruction D: Removal of the circuit boards

1. Disconnect the 2 paper low harnesses
2. Lift board and disconnect the remaining harnesses
3. The 2 auxiliary boards are removed by lifting up

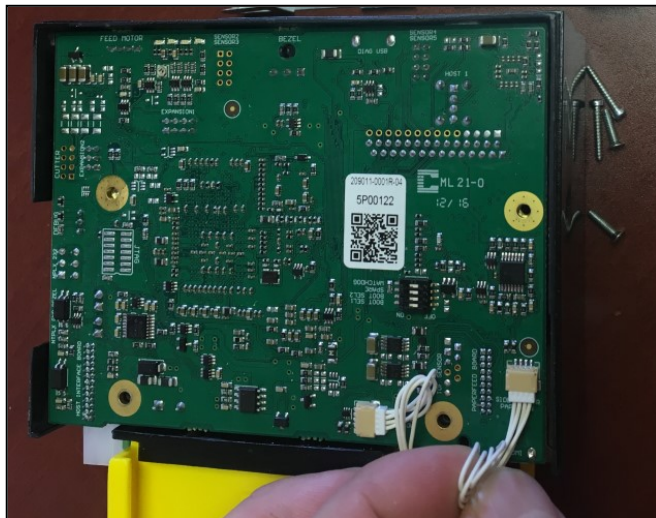


Figure 29: Circuit boards



## Instruction E: Removal of ticket inlet & Index mark (TOF) sensor

1. Remove 2 mounting screws and lift ticket inlet
2. Remove the sensor by pushing out the sensor holder

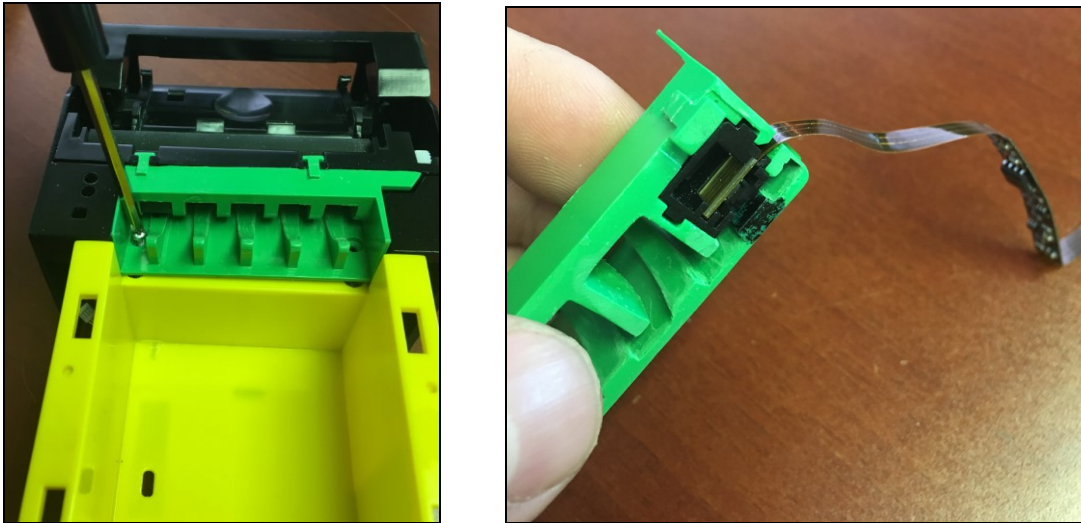


Figure 30: Ticket Inlet & Index sensor

## Instruction F: Removal of ticket tray

1. Remove 2 mounting screws and lift ticket tray

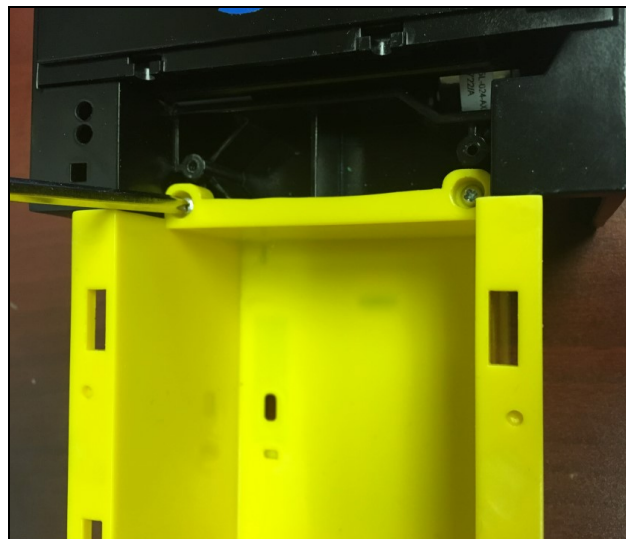


Figure 31: Ticket Tray



## Instruction G: Removal of front bar

1. Remove 2 mounting screws and lift bar



Figure 32: Front bar

## Instruction H: Removal of printing mechanism assembly

1. Lift assembly up while guiding harnesses through their corresponding access holes

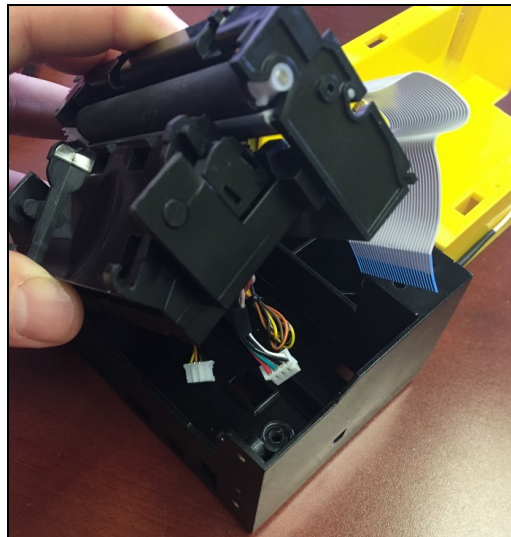


Figure 33: Printing Mech

## Instruction I: Removal of the paper guide assembly

1. Remove the mounting screw then slide the guide assembly up and away from the printing mechanism

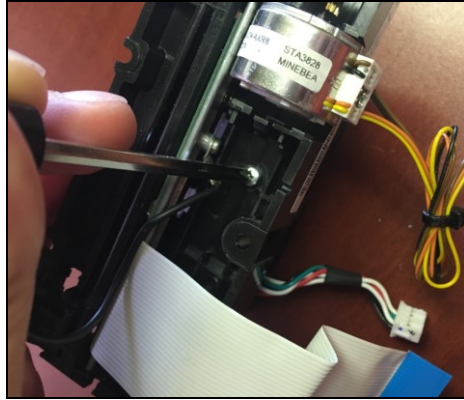


Figure 34: Paper guide

## Instruction J: Removal of the top paper guide from the assembly

1. Push out on both lower paper guide tabs at the same time while sliding the top paper guide forward.

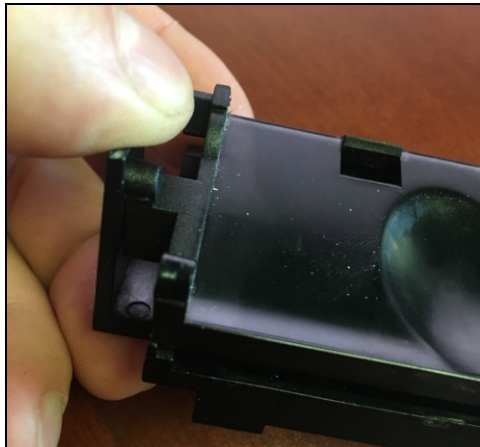
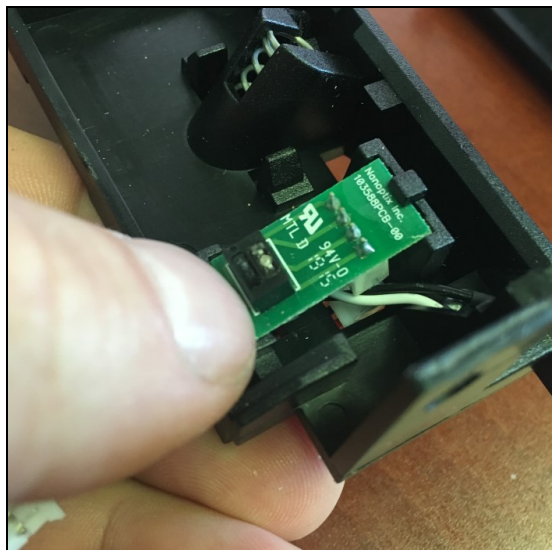


Figure 35: Top paper guide

## Instruction K: Removal of chute sensor

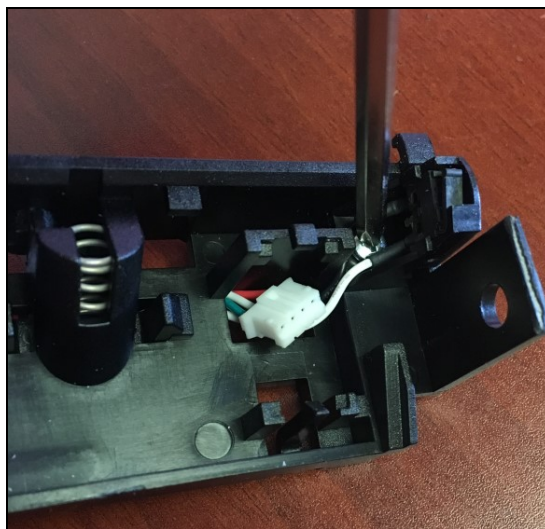
1. Push front sensor mounting clip then lift sensor up.



**Figure 36: Chute sensor**

## Instruction L: Removal of the paper guide switch assembly

1. Remove mounting screw and lift up the assembly up



**Figure 37: Guide switch**

## 5 Printer Maintenance Instructions

Note: Under normal operating conditions, the minimum interval for cleaning the Nanoptix PayCheck™ NextGen printer is *3 months* or *5 km* of paper printed, whichever comes first.

1. Remove excess dust using a portable vacuum cleaner or wipe clean with a damp cloth



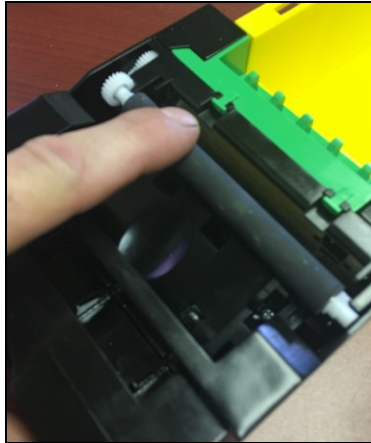
Figure 38: Remove excess dust

2. Remove top paper guide by pressing on the yellow clip and lifting up. Then pull forward to unhinge.



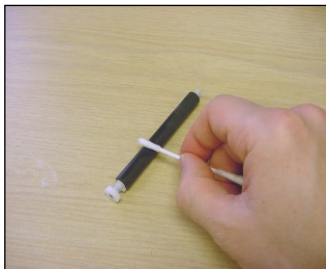
Figure 39: Remove top paper guide

3. Remove roller by pressing down and rolling towards the front of the printer



**Figure 40: Remove Roller**

- 4. Clean the roller with a cotton swab and a mild soap solution.**



**Figure 41: Clean Roller**

- 5. Clean paper guide sensor using a cotton swab**



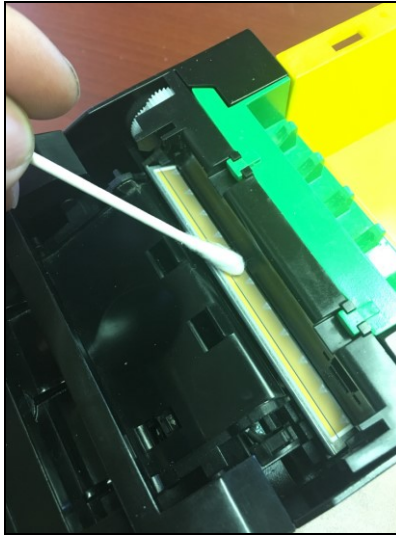
**Figure 42: Clean paper guide sensor using a cotton swab**

**6. Clear dust off gears using compressed air**



**Figure 43: Clear dust off gears using compressed air**

**7. Clean the heating elements (black line on the print head) with a cotton swab and isopropyl alcohol.**



**Figure 44: Clean heating elements**



## 6 Service & Support

### 6.1 Returning printers back to Nanoptix for repairs (RMA)

- Send repair approval request to Nanoptix Inc. which should include:
  - Printer model #
  - Serial #
  - Brief problem description
- Ship defective products to Nanoptix Inc.
- Ensure that each package being sent is identified by the specified RMA number

NOTE: Make sure to place a blank ticket or a piece of paper between the thermal print head and roller for shipping and storage.

RMA # XXXXXX  
Nanoptix Inc.  
699 Champlain St.  
Dieppe, NB, Canada  
E1A 1P6

NOTE: It is imperative to have every package clearly identified by an RMA number.

### 6.2 Technical Support Contact Information

Service department  
Nanoptix Inc.  
699 Champlain St.  
Dieppe, NB, Canada  
E1A 1P6  
Tel: +1.506.384.3388  
Fax: +1.506.384.3588  
E-mail: [service@nanoptix.com](mailto:service@nanoptix.com)  
Web site: [www.nanoptix.com](http://www.nanoptix.com)