

BLU-KNIGHT-000 Technical & User Manual

TEC-EL-04111 Version 1.0.0

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Version History

Version	Department	Date	Comments
1.0.0	Technical Documentation and R&D	2017-10-23	Original version

Contents

Version History	2
Technical Information	4
Physical Components	4
Exterior View of the Machine	6
Tower light	7
Topper (optional)	7
Removable/replaceable backlit belly logo	7
Glass Dimensions	8
Doors	9
Inside View of the Machine	
Door Switches	11
Switch Locks	
Logic Box	13
Electrical Components	14
Powering Diagram	14
List of Electrical Components	15
	15
Gaming Board	
Main Components	
Connectors	
Edge Connector Pinout (J1 and J2)–10 Buttons BLU-EXT 10B 20L (03440)	19
Technical Specifications	20
Peripherals	22
Bill Acceptor (Optional)	22
Button Panel	22
LCD Monitors and Touchscreen	23
Sìde Trim LED Controller	23
Mechanical Meters	24
Network	24
Power Distribution Unit	24
Printer (Optional)	26
Sound Amplifier, Subwoofer and Speakers	27

Installation	
Install Game onto Stand	
Installation without riser	
Installation with riser	
Lock Specifications	
Power Setup	
Maintenance	
Button Panel	
Tools Needed	
Button LED replacement	
Button lens or legend replacement	
Button replacement	
Complete button panel assembly replacement	
Power Distribution Unit (PDU)	
AC Input	
AC Output	
DC Outputs	
DC Output Pinout	45
DC Fuse Replacement	
Physical Dimensions (Mounting Requirements)	47
Environmental	
Safety / Agency Approval	
Monitor Replacement (Lower & Upper monitor)	
Step by step procedure	
Chipset Update	51
What you need	51
Procedure	51
CPU Unit Replacement	
Bill Acceptor	57
Tools Needed	57
Bill acceptor Installation	
Bill acceptor removal instructions	61
Printer	
Tools Needed	63

63
66
66
74
76
79

Technical Information

Physical Components

Cabinet Dimensions Without Accessories



Weight = 107 kg (235 lbs)

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The second screen displays the pay table and/or the bonus.



Cabinet Dimensions with Topper, Progressive Display, Candle and Stand

Exterior View of the Machine



Tower light

Available in 2 or 3 levels, the tower light signals different events, such as a door opening, an attendant call or a jackpot win.



Topper (optional)

(Choice of models: Suzo Mini-Ellipse, Gamesman GT4000 LCD Topper or TBG Magnum Poly)



Removable/replaceable backlit belly logo

The default Bluberi logo may be replaced by any personalized customer or casino logo or simply removed.



Glass Dimensions



Doors

Whenever a door is open, the tower light flashes. You can open a door safely without losing statistics or interrupting the game in progress.

Keys are provided to unlock various parts of the gaming machine: the main door, the lower door, the logic box door (see page 9) and the bill acceptor door (see page 6).

NOTE: All keylocks use standard 5/8" locks.



Inside View of the Machine



Door Switches

Four switches detect door opening and closing:

- the main-door switch
- the lower-door switch (button panel)
- the bill-door switch
- the logic-door switch

All switches operate in a "Normally Closed" mode. Each time a door is opened, its switch closes the electronic circuit, and this event is created and recorded in the event log kept in the gaming board memory.





Switch Locks

A single key either provides access to the Operator Menu or is used to clear errors, depending on the switch lock it is inserted into.

The Operator Menu switch lock gives access to the Operator Menu that allows the configuration of the game, self-diagnostic, statistics, and other options. The Clear Error switch lock allows the operator to clear errors once the problem has been solved.



Logic Box

The logic box is a covered metal box housing the gaming board. A door switch detects the opening of the logic box cover. The gaming board reads the state of the logic door switch even when the power is off. The logic box is located at the back of the gaming machine, locked with a key and linked to the machine I/Os through the backplane or through the device connectors.



Logic box key lock



Logic box inside view

Electrical Components

Powering Diagram



List of Electrical Components

Component		Quantity	Manufacturer	Model	
Power Distribution Unit		1	Bluberi Gaming Canada Inc.	ME187-601 Rev3	
Fan		2	Young Lin Tech. Co. LTD	DFB922512H	
Gaming I	board	1	Bluberi Gaming Technologies Inc.	RAPTORG2 Rev-E	
LCD touc	ch monitor	1	Litemax	DLP2302-BTW-I01 or I02	
LCD Gla	ss monitor	1	Litemax	DLP2302-BGW-I01	
Standard	button panel	4 to 15	Gamesman	800 or 1200 series	
	Lower	1	Cherry Switch	E79 microswitch	
Door	Main	1	Cherry Switch	E79 microswitch	
switch	Bill	1	TTC	TXJ10	
	Logic	1	Cherry Switch	E79 microswitch	
Switch lock		2		IGT style 2341 1 momentary (Clear Error) 1 constant (Operator Menu)	
Mechanio	cal meter	5	Suzo-Happs	42-08012-07	
Tower light		1	Suzo-Happs	11-1782	
Side trim LED controller		1	Bluberi	LED-CTRL	
Progressive display controller		1	Bluberi	Panel-RGB	
Sound amplifier		1	Bluberi AMP21XP		
Speaker		4	Fountek	FR58EX	

Gaming Board

Dimensions



Main Components



Connectors



Edge Connector Pinout (J1 and J2)-10 Buttons BLU-EXT 10B 20L (03440)

The following table presents a typical RAPTORG2 pinout for a 10-button game configuration.

Part Side	Pin	Solder Side
	Big 72-pin	
	01	
	02	
Left_Speaker_Pos	03	
	04	Left_Speaker_Neg
	05	Right_Speaker_Neg
	06	Sw_Play_200_Credits
	07	
Sw_Play_300_Credits	08	
	09	Sw_PayTable/Help
Sw_CallAttendant	10	Sw_Play
	11	Sw_Play_500_Credits
	12	Right_Speaker_Pos
Sw_Play_100_Credits	13	Sw_Drop_Door
Sw_Play_20_Credits	14	Sw_Logic_Door
Sw_Bill_Door	15	Sw_Main_Door
	16	Lp_Collect
+5 V (out)	17	
Sw_Slot#1	18	Sw_Slot#3
Sw_Slot#2	19	Enable_Coin
KeySw_Clear_Error	20	KeySw_Operator_Menu
	21	Sw_Collect
	22	
Cash_In_Meter	23	GND
Cash_Played_Meter	24	
Cash_Drop_Meter	25	
Cash_Won_Meter	26	
Sw_SelectDenom	27	Lp_Play_20_Credits
Cash_Paid_Meter	28	Lp_CallAttendant
Lp_Play_100_Credits	29	Lp_Play_200_Credits
	30	
Lp_PayTable/Help	31	Lp_Play
Lp_Play_500_Credits	32	
Lp_Play_300_Credits	33	Lp_lower_High
Lp_lower_Mid	34	Lp_lower_Low
Lp_Select_Denom	35	
GND	36	GND
	Small 20-pin	
GND	01	GND
	02	
+5 V (in)	03	+5 V (in)
+5 V (in)	04	+5 V (IN)
+12 V (in)	05	+12 V (IN)
Power_Meter	06	Power_Meter
	07	Hopper_Drive_Low
-12 V (in)	08	
GND	09	GND
GND	10	GND

Technical Specifications

Processor and Memory

- MPC8270 32-bit processor running at 400 MHz (main CPU)
- Communication Processor Module (CPM) running at 200 MHz
- Integrated PCI bridge (PCI 2.2 compliant)
- Door tracking controller monitoring access even when power is off, and keeping track of the date and time (Atmel ATMEGA 168V)
- 128 MB of flash memory for boot code
- CompactFlash connector support
- Support for 2 SATA (Serial ATA) hard drives dedicated to external data storage
- Entire program can be changed by replacing or reprogramming a single part
- Up to 1 GB (2 DIMMs) of SDRAM for CPU operations (PC100 or PC133)
- Up to 2 MB of battery backed-up RAM with hardware lock
- Actel ProAsic A3P600 for glue logic

Security

• SPHINX and SAM card for protection against piracy and software modification

Video Graphic Interface

- High performance ATI Mobility Radeon M9-CSP64 video controller
- PCI 66 MHz bus interface (experimentations show up to 240 Mb/s transfer speed on PCI)
- Analog RGB (VGA) or digital interface (DVI) output
- Can drive two monitors simultaneously
- 64 MB of internal video RAM
- Resolution up to 1600 x 1200 pixels supported and run-time adjustable by software
- Up to 32-bit colors for graphics
- Powerful 2D and 3D engines

Sound

- Digital Signal Processor (Texas DSP TMS320C6727)
- 16 parallel channels able to play WAV and MP3
- Subwoofer output with active low-pass filter available
- Powerful 30-W stereo amplifier
- SPDIF audio output available

Communication Ports

- Up to 14 serial ports available on six DB-9 and eight RJ-45 connectors
- TTL, RS-232 and RS-485 ports available
- Support for several TTL and RS-232 serial bill acceptors
- Support for most serial printers
- Support for most available touchscreens
- Dynamic Display support directly available from an RJ-45 connector
- RS-485 network capacity of up to 100 boards communicating at 115.2 Kbps fully isolated from electric surge
- 10/100 Mbps Fast Ethernet connection
- USB 1.1 Port available

Inputs and Outputs

- 31 inputs for buttons, key switches, coin switches, etc.
- 30 open-collector outputs available for lamps, meters, bell, etc.
- Hopper and ticket dispenser capabilities
- Dedicated MCU to monitor five doors 24 hrs a day, even while power is off
- Real-time clock
- 37 LEDs for maximum feedback on operations

Peripherals

Bill Acceptor (Optional)

The bill acceptor communicates with the gaming board through an RS-232 link.

Manufacturer	Model	Nominal Voltage
JCM	UBA (UBA-10-SS)	12 VDC
JCM	iVIZION	12 VDC
MEI	Cashflow SC6607	12 VDC
MEI	SC Advance SCN6607	12 VDC
Cashcode	One (FLS-0310)	12 VDC



Button Panel

The button panel can easily be replaced to be compatible with games requiring other button configurations (5, 8, 10 or 15 buttons). A game pinout document describes the functionality of each button.



LCD Monitors and Touchscreen

The LCD monitor screen measures 23" in diagonal with 16:9 aspect ratio. It is controlled by a DVI interface, thus maximizing the visual quality.

Input Power	Video Signal	Picture Ratio
+12VDC @ 2.6A	FHD mode (1920 × 1080 pixels)	16:9

The lower monitor is equipped with a touchscreen communicating with the gaming board through a serial RS-232 link.



Sìde Trim LED Controller

The LED-CTRL board allows changing the LED color and pattern on the main door side trims. This is controlled from the main board (CPU).



Mechanical Meters

Mechanical meters display game data using seven digits:

- cash in 1
- cash paid (2)
- drop (3)
- cash won (4)
- cash played (5)

1 2 3 4 5

These meters, which cannot be reset, confirm data contained in the gaming board memory. They increment each time a 12 VDC pulse is registered. The hard meters are visible when the lower door is open.

Network

The network connects gaming machines to a server through a 100Base-T Ethernet link, making it possible to manage progressives as well as cashless and accounting systems.

Power Distribution Unit

The cabinet is powered using a power distribution unit (PDU) for both AC and DC voltages. PDU integrates the main AC power inlet with an EMI filter, a thermal breaker and the main switch. It also integrates an ATX-style power supply for DC rails power.

Parameter	Min.	Nom.	Max	Unit
Vin (115 VAC)	100	115	132	VACrms
Vin (230 VAC)	200	230	240	VACrms
Vin Frequency	47	-	63	HZ

Overall maximum rating: +3.3V -> 8A on J12 +5V -> 14A (8A on J1 & J12; 6A on J8) +5VSB -> 1A on J12 +12V -> 24A MAX COMBINED (4A on J1 & J12; 6A on J2; 6A on J3; 6A on J4; 6A on J5; 6A on J6; 6A on J7; 1A on J11) -12V -> 0.5A on J1, J2 & J12 +24V -> 8A (4A on J9; 4A on J10)



Each component inside the cabinet is powered independently from the power distribution unit. Each segment is fuse-protected. To quickly determine whether a fuse is blown, check the LED under it.

LED ON: Fuse is OK LED OFF: Fuse is blown

PDU DC Section				
CPU Tray (J1)	This output supplies power to the CPU enclosure (main board).			
Audio (J2)	This output supplies power to the audio amplifier board.			
Bill (J3)	This output supplies power to the bill acceptor.			
Prog. (J4)	This output supplies power to the progressive LED display.			
Topper (J5)	This output supplies power to the optional topper and the tower light.			
Lights (J6)	This output supplies power to the side trim LED controller, fans, belly logo, and service lamp.			
Printer (J9)	This output supplies power to the ticket printer.			
Audio 24V (J10)	This output supplies +24V power to the audio amplifier board.			
Button (J11)	This output supplies power to the button panel.			
Expansion (J12)	This output supplies power to the CPU enclosure (expansion power).			

Printer (Optional)

The ticket printer communicates with the gaming board through an RS-232 link.

Manufacturer	Model	Nominal Voltage
Nanoptix	Paycheck 4	24 VDC
Future Logic	GEN II Universal (PSA66-ST2R)	24 VDC
Transact	Epic 950L	24 VDC





Sound Amplifier, Subwoofer and Speakers

The subwoofer and speakers are driven by the AMP21XP, a dedicated board amplifying the left and right outputs of the gaming board and adding a special output for a loudspeaker.





Speaker

Installation

Install Game onto Stand

Complete the following steps to mount the game. A drill fixture is available from Bluberi. To obtain the fixture, contact Bluberi Gaming.

Bluberi recommends using the drill fixture to drill four anchor holes and one wire access hole into the top of the stand. Position the template by setting it flush with the back of the stand, then centering it.

BLU-KNIGHTS Drill Fixture



NOTE: Space the games at least 4.5" apart.

Installation without riser

1- Uses four included 5/16-18 x 1.5" flanged hex head screw to attach stand to the game from inside of the stand. Self-clinching nuts are included inside of the game for direct installation (nuts are not required).

If you install a stand with a ticker top plate or a VSR stand with sliding bracket technology, use four included $5/16-18 \times 2.0$ " flanged hex head screw. With the VSR stand, we strongly suggest to use included fender washer on the sliding bracket side.



Installation with riser

- 1- Uses four included 5/16-18 x 1.5" flanged hex head screw to attach game to riser from inside of the game (most distant holes). Self-clinching nuts are included inside of the riser for direct installation (nuts are not required).
- 2- Uses four included 5/16-18 x 1.5" flanged hex head screw to attach stand to the riser from inside of the stand. Self-clinching nuts are included inside of the riser for direct installation (nuts are not required).

If you install a stand with a ticker top plate or a VSR stand with sliding bracket technology, use four included $5/16-18 \times 2.0^{\circ}$ flanged hex head screw. With the VSR stand, we strongly suggest to use included fender washer on the sliding bracket side.



Back to back installation

It is required to attach games back to back for security purpose. Use included ¼-20 x 0.75" flanged hex head screw to attach both back to back games together (one screw on each side). Self-clinching nuts are installed inside of cabinet for direct installation (nuts are not required).



Lock Specifications

Lock Location	Designed Length	CAM Picture	CAM Part No.	Lock Rotation
Upper (Main) Door	5/8"		114073	90° Right Hand
Lower (Belly) Door	5/8"		114472	90° Right Hand
CPU Enclosure	5/8"		114473	90° Right Hand
Bill Acceptor Cassette Door	5/8" *	0	114068	90° Right Hand

*A spacer ring is included for the bill acceptor door

Power Setup

Complete the following steps to connect the game to an approved power source:

WARNING: Plugging your game into an improper line voltage source may create a fire and/or electrical shock hazards. An improper line voltage or frequency can also cause game damage or malfunctions.

Use of the included IEC C13 16AWG (SJT) detachable power cord is mandatory for the application.

Game shall not be mounted in an area where a water jet could be used.

- 1- Verify that the line voltage at the outlet is either 120 VAC or 220-240 VAC with a minimum of 200W of available power.
- 2- Use an outlet tester to check for properly implemented ground, hot and neutral outlet wiring. Only use a grounded AC outlet. The gaming device accepts a line frequency of 50 to 60 Hz. Plugging your game into an improper line voltage source may create a fire and electrical shock hazard. If the outlet checks okay, proceed to the next step.
- 3- Confirm that the game is switched off at the power switch. Feed the AC power cord through the wire access hole, and through the stand. Plug the female end of the line cord into the power distribution unit. Then plug the male end of the line cord into the tested socket.



Maintenance

Button Panel

Tools Needed

- Phillips screwdriver
- Flat blade screwdriver
- Cutter
- Long nose pliers
- Push button cap removal tool



Push button cap removal tool

Button LED replacement

1- Using push button cap removal tool, remove button cap from the defective button.



2- Remove the legend and lens.


3- Using pliers, pull on LED assembly until it comes off.



4- Please make sure to note the orientation of LED assembly blades before you insert the new one.



- 5- Insert new LED assembly.
- 6- Reinstall lens and legend (lens is installed first).
- 7- Reinstall button cap.

Button lens or legend replacement

- 1- Perform steps #1 & #2 above.
- 2- Replace legend or lens with new one and perform steps #6 & #7 above.

Button replacement

- 1- Open the belly door.
- 2- Using a Phillips screwdriver, loosen & remove four screws holding the button panel assembly.



3- Remove button panel bottom plate (four Philips screws)



- 4- Disconnect harness from the defective push button.
- 5- Using a flat blade screwdriver, push on button clips (4) to remove the push button from the button panel assembly.



- 6- Install the new button.
- 7- Reconnect harness to the new button.
- 8- Reinstall button panel bottom plate.
- 9- Reinstall four Philips screws holding the button panel assembly.

Complete button panel assembly replacement

- 1- Perform steps #1 & #2 above.
- 2- Cut holding tie-wraps that hold button panel harness inside of cabinet.



3- Disconnect button panel harness from the main harness.



- 4- Install the new button panel assembly.
- 5- Connect new button panel assembly to the main harness.
- 6- Install new tie-wraps to secure the button panel harness.

Power Distribution Unit (PDU)

This section provides detailed information on the of ME187-601 Rev3 power distribution unit manufactured for Bluberi Gaming Technologies. It also provides the procedure for fuse maintenance. ME187-601 PDU is a 400W self-contained AC to DC power supply source and suitable for mounting in gaming cabinets. The power distribution unit also includes switched and unswitched AC outputs with circuit protection (thermal breaker).

AC Input

The table below lists AC input voltage and frequency requirements for continuous operation. The power supply is capable of supplying full-rated output power over two input voltage ranges rated 100-132 VAC and 200-240 VAC rms nominal. The correct input range for use in a given environment is auto ranging. The power supply is automatically recovered from AC power loss.

Parameter	Min.	Nom.	Max	Unit
Vin (115 VAC)	100	115	132	VACrms
Vin (230 VAC)	200	230	240	VACrms
Vin Frequency	47	_	63	HZ



AC Input Connector

Input current is limited to 10A (two 5A thermal breakers). Use of an IEC C13 16AWG (SJT) detachable power cord is mandatory for the application.

The power supply is capable of withstanding 2200 VDC potential between the input and ground for a period of 1 minute.

AC Output

Switched AC Outlets

The power distribution unit (PDU) features four (4) switched AC outputs on IEC 320 C14 outlets. Total combined current for those four outlets is 5A (5A thermal breaker). Those outlets are intended for use with cabinet standard components such as monitors. They will be cycled with the rocker switch.



Switched AC Outlets

Unswitched AC Outlets

The power distribution unit (PDU) features two (2) unswitched AC outputs on IEC 320 C14 outlets. Total combined current for those two outlets is 5A (5A thermal breaker). Those outlets are intended for use with external add-on components such as player interface SMIB. Power will be available on those outlets even if the main rocker switch is in off position.



Unswitched AC Outlets

AC Fault Condition

If a fault condition (excessive current) has been detected on one or many AC outlets, the corresponding AC outlets group (switched or unswitched) will be disabled (tripped thermal breaker). Fix faulty condition on AC outlets and push thermal breaker actuator back in.



Tripped Thermal Breaker

DC Outputs

DC outputs Regulation

The DC output voltages are within the regulation ranges shown in the table below when measured at the load end of the output connectors under all line, load and environmental conditions.

Output	Range	Min.	Nom. (*)	Max	Unit
+3.3VDC	+/- 5%	+3.14	+3.30	+3.47	Volts
+5VDC	+/- 5%	+4.75	+5.00	+5.25	Volts
+5VSB	+/- 5%	+4.75	+5.00	+5.25	Volts
+12VDC	+/- 5%	+11.40	+12.00	+12.60	Volts
-12VDC	+/- 10%	-10.80	-12.00	-13.20	Volts
+24VDC	+/- 5%	+22.80	+24.00	+25.20	Volts

DC Outputs Regulation

*ATX +12VDC peak loading regulation at the +12VDC output can go to +/- 10%.

DC outputs current ranges

The power distribution unit features fifteen (15) separate circuits which are independently fuse protected. Each circuit is defined for a specific usage. See table below for details.

FUSE	VOLTAGE	FUNCTION	CONNECTOR PINS	PIN QTY	FUSE RATING
F1	-12V	CPU TRAY, CPU TRAY EXPANSION, AUDIO	J1(7) ; J2(3-4) ; J12(16)	4	1A, 5x20MM, 250V, FAST ACTING
F2	+12V	CPU TRAY, CPU TRAY EXPANSION	J1(5-6) ; J12(15)	3	4A, 5x20MM, 125V, FAST ACTING
F3	+5VSB	CPU TRAY EXPANSION	J12(14)	1	1A, 5x20MM, 250V, FAST ACTING
F4	+3.3V	CPU TRAY EXPANSION	J12(1-3)	3	8A, 5x20MM, 125V, FAST ACTING
F5	+5V	CPU TRAY, CPU TRAY EXPANSION	J1(1-4) ; J12(4-7)	8	8A, 5x20MM, 125V, FAST ACTING
F6	+12V	AUDIO	J2(1-2)	2	6A, 5x20MM, 125V, FAST ACTING
F7	+12V	BILL	J3(1-3)	3	6A, 5x20MM, 125V, FAST ACTING
F8	+12V	PROGRESSIVE DISPLAY	J4(1-3)	3	6A, 5x20MM, 125V, FAST ACTING
F9	+12V	TOPPER	J5(1-3)	3	6A, 5x20MM, 125V, FAST ACTING
F10	+12V	LIGHTS	J6(1-3)	3	6A, 5x20MM, 125V, FAST ACTING
F11	+12V	SPARE	J7(1-3)	3	6A, 5x20MM, 125V, FAST ACTING
F12	+5V	SPARE	J8(1-2)	2	6A, 5x20MM, 125V, FAST ACTING
F13	+24V	PRINTER	J9(1)	1	4A, 5x20MM, 125V, FAST ACTING
F14	+24V	AUDIO	J10(1)	1	4A, 5x20MM, 125V, FAST ACTING
F15	+12V	BUTTONS	J11(1)	1	1A, 5x20MM, 250V, FAST ACTING

Fuse Circuits

The table below lists authorized replacement fuses.

	SOUF	RCE #1	ALTERNATE #1 ALTERNATE #2				
FUSE AMP	MFG	P/N	MFG	P/N	MFG	P/N	Description
1A	BUSSMANN	BK/GMA-1-R	BUSSMANN	BK1/GMA-1-R	LITTELFUSE	0217001.MXP	FUSE, FAST-ACTING, 1AMP, 250V, (5MM X 20MM)
4A	BUSSMANN	BK/GMA-4-R	BUSSMANN	BK1/GMA-4-R	LITTELFUSE	0235004.HXP	FUSE, FAST-ACTING, 4AMP,125V , (5MM X 20MM)
6A	BUSSMANN	BK/GMA-6-R	BUSSMANN	BK1/GMA-6-R	LITTELFUSE	0235006.HXP	FUSE, FAST-ACTING, 6AMP,125V , (5MM X 20MM)
8A	BUSSMANN	BK/GMA-8-R	BUSSMANN	BK1/GMA-8-R	LITTELFUSE	0217008.HXP	FUSE, FAST-ACTING, 8AMP,125V , (5MM X 20MM)

Authorized Replacement Fuses

The table below lists intended usage of each DC output connector.

CONNECTOR	FUNCTION	DESCRIPTION
J1	CPU TRAY	This output supplies power to the CPU enclosure (main board)
J2	AUDIO	This output supplies power to the audio amplifier board
13	BILL	This output supplies power to the bill validator
J4	PROG.	This output supplies power to the progressive LED display (WAP)
J5	TOPPER	This output supplies power to the optional topper box and candle light
J6	LIGHTS	This output supplies power to the side trim LED controller (LED strips), fans, belly logo and service lamp
J7	SPARE +12V	This output supplies power for optional +12V
18	SPARE +5V	This output supplies power for optional +5V
19	PRINTER (+24V)	This output supplies power to the thermal ticket printer (+24V)
J10	AUDIO (+24V)	This output supplies power to the audio amplifier board (+24V)
J11	BUTTONS	This output supplies power to the button panel (player interface)
J12	CPU TRAY EXPANSION	This output supplies power to the CPU enclosure (expansion power)

DC Output Connectors

Overall maximum rating:

+3.3V	->	8A on J12
+5V	->	14A (8A on J1 & J12; 6A on J8)
+5VSB	->	1A on J12
+12V	->	24A MAX COMBINED
		(4A on J1 & J12; 6A on J2; 6A on J3; 6A on J4;
		6A on J5; 6A on J6; 6A on J7; 1A on J11)
-12V	->	0.5A on J1, J2 & J12
+24V	->	8A (4A on J9; 4A on J10)

Maximum continuous total DC outputs power shall not exceed 400W.
 Maximum continuous load on +3.3V, +5V, +12V and +24V outputs shall not exceed 385W.

DC Output Pinout

HTS) V	Fuse Circuit	F10	F10	F10				
J6 (LIGHTS) +12V	Function	+12V	+12V	+12V	GND	GND	GND	
	Pin	1	2	3	4	5	9	

	Fuse Circuit	F11	F11	F11				
J7 (SPARE) +12V	Function	+12V	+12V	+12V	GND	GND	GND	
	Pin	1	2	3	4	5	9	

	Fuse Circuit	F12	F12	-		
J8 (SPARE) +5V	Function	+5V	+5V	GND	GND	
	Pin	1	2	3	4	

J9 (PRINTER) +24V	Function Fuse Circuit	+24V F13	- GND	
	Pin F	1	2	

	Fuse Circuit	F13			Fuse Circuit	F14	
J9 (PRINTER) +24V	Function	+24V	GND	J10 (AUDIO) +24V	Function	+24V	GND
	Pin	1	2		Pin	1	2

	Fuse Circuit	F6	F6	τı	H		-	-	
J2 (AUDIO) +12V, -12V	Function	+12V	+12V	-12V	-12V	GND	GND	GND	GND
	hin	1	2	3	4	5	9	2	8

	Fuse Circuit	F7	F7	F7		-	
J3 (BILL) +12V	Function	+12V	+12V	+12V	GND	GND	GND
	Pin	1	2	3	4	5	9

	Fuse Circuit	F8	F8	F8		-		
J4 (PROG.) +12V	Function	+12V	+12V	+12V	GND	GND	GND	
	Pin	1	2	3	4	5	9	

	Fuse Circuit	E9	F9	E9			
J5 (TOPPER) +12V	Function	+12V	+12V	+12V	GND	GND	GND
	Pin	1	2	3	4	5	6

J TRAY) 2V, -12V	Fuse Circuit	F5	F5	F5	F5	F2	F2	F1		-	-	-	-		
J1 (CPL +5V, +1	Function	+5V	+5V	+5V	+5V	+12V	+12V	-12V	РОК	GND	GND	GND	GND	GND	GND
	Pin	1	2	3	4	5	9	7	8	6	10	11	12	13	14

TTONS)	2V	Fuse Circuit	F15	-	-	(EXPANSION)
J11 (BU	+1	Function	+12V	GND	GND	J12 (CPU TRA)
		Pin	1	2	3	

TRAY) 21-130	Euse Circuit	F5	F5	F5	F5	F2	F2	H					•			TTONS) 2V	Fuse Circuit	F15			r EXPANSION) /SB. +12V12V	Fuse Circuit	F4	F4	F4	F5	F5	F5	F5		-					F3	F2	
ון (CPU דדע דזי	Function	+5V	+5V	+5V	+5V	+12V	+12V	-12V	РОК	GND	GND	GND	GND	GND	GND	J11 (BU +1	Function	+12V	GND	GND	J12 (CPU TRA) +3.3V, +5V, +5\	Function	+3.3V	+3.3V	+3.3V	+5V	+5V	+5V	+5V	GND	GND	GND	GND	GND	РОК	+5VSB	+12V	
	pin	1	2		4	5	9	2	∞	6	10	11	12	13	14		Pin	1	2	3		Pin	1	2	æ	4	5	9	7	8	6	10	11	12	13	14	15	

DC Fuse Replacement



Figure 11: Fuse Cover

To replace a blown fuse, unscrew both knurled head thumb screws and remove Lexan fuse cover. A LED light is located directly under each fuse. For quick identification, a blown fuse is indicated by a turned off LED light. Make sure to replace only with fuse of the specified current rating and type according to the authorized replacement fuse list in above Fuse Circuits Table. Re-install fuse cover Lexan after fuse replacement.

Physical Dimensions (Mounting Requirements)



Figure 12: Physical Dimensions

Environmental

Operating

Temperature: 0°C to 50°C Humidity: 20% to 80% relative humidity (non-condensing) Altitude: -60 meters to 3,048 meters

Non-operating

Temperature: -25°C to 85°C Humidity: 10% to 90% relative humidity (non-condensing) Altitude: -60 meters to 15,244 meters

Safety / Agency Approval

UL/CUL 60950-1

UL File Number: E474237

FCC Part 15, Subpart B, Class A

Monitor Replacement (Lower & Upper monitor)

Step by step procedure

- 1- Open the main door.
- 2- Disconnect cables (3 for lower & 2 for upper) from the monitor. Remove cables from P-Clamps holder mounted onto the monitor.
- 3- Using an 11/32" nut driver, loosen the four #8-32 kep nuts holding the monitor (two on each side). Just loosen without removing them.



4- Do not forget to disconnect the ground strap from the monitor housing.



Lower Monitor

- 5- Remove the monitor from the main door frame by sliding it up and then pull it out from the frame.
- 6- For the lower monitor, make sure that the replacement monitor includes a touch screen.
- 7- Using a Philips screwdriver, removes the mounting bracket (four screws) and P-Clamps from the defective monitor and install them onto the replacement monitor exactly as it is mounted on the original monitor.



- 8- Reinstall the new monitor back onto the main door frame.
- 9- Tighten the four #8-32 kep nuts that hold the monitor & reinstall the ground strap.
- 10-Insert cables into the P-Clamps & reconnect cables to the new monitor.
- 11-Close the main door.

Chipset Update

What you need

- Main door key
- Logic box key
- RAM Clear SSD and procedure
- New game chipset
 - Sphinx security chip
 - SAM security card
 - o Game SSD

Procedure

Step 1: Follow TEC-EL-4043 procedure to complete the RAM Clear operation

Step 2: Replace the RAM Clear SSD by the new game SSD

Step 3: On the RaptorG2 gaming board locate the location of the Sphinx and the SAM card as shown in the following picture. Remove the old components and replace them with the new security chipset. Make sure to properly align the dot on the Sphinx label with the dot on the PCB silkscreen.



Step 4: You are now ready to secure the logic box by replacing the cover and then power up the cabinet.

CPU Unit Replacement

- 1- Open the main door.
- 2- Unlock & remove the CPU unit cover.



3- Untighten captive screws (2) on the left side. Disconnect cables from the CPU unit.



- 4- Slide out (to the right) the CPU unit tray assembly.
- 5- Remove chipset components from the defective CPU unit tray & reinstall on the new CPU unit assembly.



SPHINX security device

Make sure to align pin #1 of component with pin#1 on the board.



<u>SAM card</u>

There is two different SAM socket available. Make sure to install device with correct orientation. The first model is a hinged version. To unlock, slide cover to the back and open the cover. Slide card inside cover retaining clip. Close the socket and slide cover to the front for the lock position.



The second model is a fixed cover version. Simply pull on the card to remove and push on the card to install in socket. Make sure to install device with correct orientation.



Solid State Drive (SSD) device

Make sure to install SSD device with the label "This Side Up" facing you. Push SSD device inside the socket until you feel it is fully inserted.



6- Slide new CPU unit assembly inside the cabinet.

7- Tighten captive screws (2) & reconnect cables to the new CPU unit. To help technicians, labels are printed on cables inside the CPU unit enclosure to help quick identification of the proper connection. Labels are also printed on CPU unit connectors.



8- Reinstall and lock CPU unit cover.

Bill Acceptor

Tools Needed

Ensure that you have all the keys needed to access the bill acceptor: Main door, Belly door and bill acceptor keys. For the installation, you only need four pan screws 6/32" x 3/8" and a long Philips #2 screwdriver.



Tools needed for bill acceptor installation and removal

Bill acceptor Installation

For easy access, unlock and open the main door, belly door and bill acceptor doors. Also, push the printer plate upward until it lock.



Easy access to the bill acceptor

Sliding the Bill acceptor frame

Remove the cassette from the bill acceptor frame. Slide the bill frame in the cabinet tilting it slightly toward you. Continue sliding it down and push the head of the bill acceptor backward to its place.



Insert the Bill acceptor to its place

Fix the bill acceptor to its place

Fix the Bill acceptor with the four $6/32'' \times 3/8''$ screws using the long #2 Philips screwdriver.



Fix the bill acceptor to its place

Plug the Bill acceptor connector

Plug the connector and carefully place the cable out of moving part's way.



Plug the Bill acceptor connector

Insert the cassette into the bill acceptor frame

Slide the cassette to its place and close/lock the door.



Insert the cassette into the bill acceptor frame

Check the door bezel adjustment with the bill acceptor bezel

Ensure that the door's bezel match well on the bill bezel teeth.



Check bill acceptor bezel adjustment

Bill acceptor removal instructions

Unlock the bill acceptor's door



Unplug the bill acceptor connector



Unplug the bill acceptor connector



Remove the cassette from the bill acceptor

Remove the four 6/32" x 3/8" screws



Remove the four 6/32" x 3/8" screws

Pull the bill acceptor out

Gently pull the bill acceptor frame tilting it forward and first head down then the whole assembly upward.



Pull the bill acceptor out

Printer

Tools Needed

Ensure that you have the main door's key needed to access the printer. For the installation, you only need four flat M4 x 5/16" screws and a Philips #2 screwdriver.



Tools needed

Future Logic GENII

1- The Gen2 printer has a plastic P-Clamp on the mounting shelf left corner that holds the cable. Using a 5/16" nutdriver, remove the P-Clamp holder to release the cable.



- 2- Disconnect printer cable from the main harness.
- 3- Push the printer frame upward until it lock. You now have access to mounting screws.



Push the printer frame upward for screw access

- 4- Remove the printer from the assembly.
- 5- Remove the plastic P-Clamp that holds the cable on the new printer.



6- Use the four M4 x 5/16" Flat head screw to install the new printer in place.



Fix the printer in place

- 7- Using the pull pin, release the printer mounting shelf until it is properly seated down in place. Reinstall plastic P-Clamp holder removed at step #1.
- 8- Reconnect printer to the main harness.



Plug the printer connector

9- Make sure printer's cable are out of the moving part's way



Place the printer's cable out of the moving part's way

Troubleshooting

Basic Game Troubleshooting

Game Condition	Troubleshooting Steps	Action
The game is plugged in and whole game is blacked out. (No lights on PDU)	Check the power cord from the outlet to the PDU. Check the PDU switched outlet breaker. Replace PDU.	Replace if necessary. If tripped, reset breaker.
The game is plugged in and both LCD are blacked out. (PDU rocker switch light turned ON)	Check PDU STATUS LED. Check PDU rail LED (+3.3V, +5V, +12V, -12V, +24V). Check the fuses on the PDU. Check +5V status LED on the CPU (top right corner). Check +3.3V status LED on the CPU (top right corner). Check DMS-59 to dual DVI Y-Splitter cable connections.	If STATUS LED flashes periodically, replace PDU. If one rail missing, replace PDU. If one fuse is blown, replace the fuse. If +5V LED light is not on, replace CPU main fuse. If +3.3V LED light is not on, replace CPU board. Tighten connections. Make sure DMS-59 connector is not upside down. Replace if necessary.
Upper or lower LCD blacked out.	Check the power cord from the PDU to the LCD. Check the DVI cable from the CPU to the LCD. Check DMS-59 to dual DVI Y-Splitter cable connections. Check LCD.	Replace if necessary. Replace if necessary. Tighten connections. Replace if necessary. Replace LCD if necessary.
Lower LCD touchscreen doesn't work.	Verify that TOUCH RXD LED flashes on CPU board when you touch the sensor. Replace lower monitor. Replace CPU board.	Replace DB9 serial communication cable if required.
Buttons switches are not working.	Check connection from the Button Panel to the Belly Door. Check connection from Belly Door to the CPU board. Check the button micro switches. Replace the CPU board.	Repair broken connection. Repair broken connection. Replace where necessary.
Buttons lamps are not working.	Check for blown PDU fuse (F15). Check connection from the Button Panel to the Belly Door. Check connection from Belly Door to the CPU board. Check the button lamps. Replace the CPU board.	If fuse is blown, replace the fuse. Repair broken connection. Repair broken connection. Replace where necessary.
Tower light is not working.	Check for blown PDU fuse (F9). Check to see if tower light is connected to main harness. Check connection to CPU board. Check tower light bulbs. Replace CPU board.	If fuse is blown, replace the fuse. Connect to the main harness. Repair broken connection. Replace defective bulbs.
There is no sound coming from the game.	Check audio amplifier potentiometer adjustment. Check audio amplifier rail LED (+12V, -12V, +24V). Check audio amplifier +3V3 LED. Verify audio amplifier lock LED is ON. Check connections between audio amplifier and speakers. Verify speakers. Replace audio amplifier.	Adjust master gain and bass potentiometer. If one rail missing, look for blown PDU fuse (F1, F6, F14). If +3V3 rail missing, replace audio amplifier. If lock LED is OFF, replace (if required) in the following sequence: RCA cable, audio amplifier, CPU board. Repair broken connection. Replace speakers if necessary.
Belly logo lighting and/or printer bezel lighting and/or bill validator bezel lighting do not turn on.	Check for blown PDU fuse (F10). Check presence of +12V at the LED strip connector. Replace LED strip.	If fuse is blown, replace the fuse. If required, fix broken connection.
Both upper door sides trim LED do not turn on.	Check for blown PDU fuse (F10). Check presence of +12V at the LED-CTRL controller. Replace LED-CTRL controller. Replace both LED strip.	If fuse is blown, replace the fuse. If required, fix broken connection.
Both upper door sides trim LED turn on at boot up but do not change with game events.	Check connection between CPU and LED controller (RJ45). Replace LED-CTRL controller. Replace CPU board.	Replace if necessary.

Upper door side trim LED do not turn on (one side).	Check wiring between controller and LED strip connector. Replace LED strip.	If required, fix broken connection.
Progressive display is not working.	Check for blown PDU fuse (F8). Check presence of +12V at the progressive display. Check progressive display rail LED (+1V5, +3V3, +5V). Check connection between CPU and display (RJ45). Replace progressive display. Replace CPU board.	If fuse is blown, replace the fuse. If required, fix broken connection. If one rail missing, replace progressive display. Replace if necessary.
Game keeps rebooting.	Check for blown fuse on PDU. Ensure that LED's on the PDU are not blinking. Using a multimeter, test +5V rail on PDU J1 connector. Replace the SSD card. Replace the CPU.	If fuse is blown, replace the fuse. Replace PDU. Voltage between pin #1 and pin #9 -> if voltage less than 4.95V, replace PDU.
No player tracking communication to the back end.	Verify that SMIB is properly powered. Check the harness that goes connects the SMIB to CPU. Check for proper game and back end configuration. Replace the SMIB.	Check PDU service outlet breaker. Reset if tripped. Replace if necessary. Configure the player tracking options on both the game and the back end.

Diagnostic Tools

Bluberi CPU board includes diagnostic tools to test game components and verify functionality.

To access *Diagnostic Menu*, turn the Operator Menu key and select "Diagnostic" on the screen. The following menu will appear.



Bill Acceptor Elite Acceptor Elite Acceptor test Equation server i lange statute Land Shiftic: Land Shiftic: Statute Statute Model Mode	To test that the bill acceptor properly detects bill insertion and to display information about the connected bill acceptor.
Doors Poors Teacher Many (Magnetic Findowski) Man door: Indowski) Died door: Indowski) Died door: Indowski) Died door: Indowski) Died door: Indowski) Died door: Indowski)	To test the switches of the doors.
DSP Statistics	To display statistics about the DSP
IDE Speed	To display information about the CompactFlash memory or the Solid State Drive (SSD) along with its read and write timings

V/O V	To test the input and output components connected to the board. Use this button to test the working order of switches, buttons, meters, lamps, and the tower light. The gaming-machine inputs are listed in the left column. Asterisks identify the inputs already tested while red characters identify inputs currently being tested. Outputs are listed in the right column. To test an output represented by a red box, turn the Operator Menu key while pressing the box. Red boxes correspond to mechanical meters. Be careful when modifying them since any modification to these outputs affects the accounting
LED Display	To test the LED display
LED DISPLAY Spectra monor Logophic (inf Date: Version: LDI RGB 2.04 Reart date: Reart date:	
Meters	To test the machine physical meters
METERS Trans a circle (Transformation and Constraint Constraint and Constraint) Memory and Constraint (Constraint) Memory and Constraint) Memory and Constraint Constraint Constraint (Constraint) Memory and Constraint) Memory and Constraint Constraint (Constraint) Memory and Constraint) Memory and Constraint (Constraint) Memory and Constraint) Memory and	
Monitors	To verify that every hue programmed is displayed, to test the screen, and to adjust the image size. Verify that the four screen corners appear on the monitor. Use the adjustment buttons to size the grid properly.
--	--
Printer	To display information about the connected printer and to test the communication between the gaming board and the printer. Clear Error To clear a pending printer error that has been corrected Poll Printer To request the printer status information. It also allows determining whether the connection is properly configured Test Ticket To print an empty ticket displaying only the header
RAM Backup	To test the condition of the RAM that secures the backup statistics
SAM Card Sam Card Info Type of the Information of the Card Second Nation 4 Streets Clave to 0007 Clave to 0007 State States to 0007 State Card 1495 State Card Information of the States to 0007 State Card 1495 State Card Information of the States to 0007 States to 1495 States to 1495 States to 1495 States to 0007 States to 0007 State	To display information about the SAM card

SDRAM	To test the condition of the SDRAM
<section-header><section-header><section-header><section-header><section-header><section-header><section-header><section-header><section-header></section-header></section-header></section-header></section-header></section-header></section-header></section-header></section-header></section-header>	
Sound	To test the condition of the sound memory
Sound Cape are none Diagonal & / Burd Sound (8 MB): OK Prev Sound Filey Snd No, 1 Neet Sound Long	
SPHINX	To display information about the SPHINX and related
SPHINX INFO Texase transmission related Analysis for the second fo	Collect To collect the SPHINX data on a smart card.
Verification numbers	To display information that may be used to validate the
VERIFICATION NUMBERS Operation misu: Using and L Numbers Firmware ID 01193067-899902A2 Overail CRC32 B0729682 SH43 Computed Site SH43 Computed Site	Firmware ID: The unique identification number of the current software version.
	Overall CRC32: The CRC 32-bit computation (Cyclic Redundancy Check) performed on the downloaded software
	SHA1: The SSD/CompactFlash data computation which results in a 20-byte signature to validate the game programmed
	SHA1 Computed Size: The SSD/CompactFlash size data computation

To test the conditions of the video RAM.

Tilt Codes

The table below lists the most common tilt codes displayed by the CPU board (blue screen) and possible solution(s).

Display	Definition	Possible Solution(s)
Main Door Open	Upper door (main) or lower door (belly) is open.	Check that both the main door and the belly door are properly closed. Check connections on both cherry switch (upper & lower door). Replace switch. Replace the CPU Board.
Logic Door Open	Logic door is open.	Check the CPU box cover. Check connections on cherry switch. Replace switch. Replace the CPU Board.
Drop Door Open	Drop door is open.	Check the Drop Box Door. Check connections on cherry switch. Replace switch. Replace the CPU Board.
Bill Door Open	Bill acceptor door is open.	Check the Bill Acceptor Door. Check connections on cherry switch. Replace switch. Replace the CPU Board.
Bill Acceptor - Jammed in Acceptor	The bill validator reported that an accepted bill or ticket is jamming the acceptor.	Check the Bill Acceptor head for jammed bills or tickets.
Bill Acceptor - Jammed in Stacker	The bill validator reports a jam in the cashbox.	A bill jam occurred in the transport section of the Acceptor or an abnormality was detected while the bill was being pushed inside the cashbox.
Bill Acceptor Stacker Open	The cashbox is removed.	Replace the Cashbox or verify that it is properly seated.
Bill Acceptor Absent	There is no communication between the CPU and the bill validator.	Make sure that the correct BV model and settings are selected in the operator menu. Verify that the correct firmware is loaded on the BV. Check for blown PDU fuse (F7). Check connection between CPU and BV.
Bill Acceptor Failure	The Bill Acceptor reported that one of the following components has failed: Stack Motor Failure Feed Motor Speed Failure Cashbox Not Ready Validator Head Error ROM Failure Boot ROM Failure External ROM Failure External ROM Writing Failure Communication Error Invalid Command	Replace bill validator head.
Bill Acceptor Cheated Error	The Bill Acceptor detected a cheat attempts.	Check the Bill Acceptor for evidence of stringing or other cheating attempts.

Printer Absent	There is no communication between the CPU and the ticket printer.	Make sure that the correct printer model and settings are selected in the operator menu. Verify that the correct firmware is loaded on the printer. Check for blown PDU fuse (F13). Check connection between CPU and printer.
Printer Head is Up	The printer head (transport section) is opened.	Close the printer head.
Printer Open	The printer inner chassis is not in the fully racked position.	Make sure printer inner chassis is in the full-racked position. Make sure it is properly seated.
Printer Paper Out	No paper detected in printer.	Load more paper into the printer. Make sure to insert paper with the proper orientation.
Printer Missing Index Marks	This error alerts the user to the presence of the wrong kind of paper in the printer or paper inserted in the wrong direction.	Use correct paper specification or install paper with correct orientation.
Printer Paper Jam	This error alerts the user to the presence of a paper jam in the printer head.	Open the printer head and ensure that all paper paths from the entry point at the back of the printer to the ticket module chute are clear of paper or obstructions.
Printer Voltage Error	The printer has detected a head supply voltage outside of range.	Using a multimeter, verify voltage at the PDU (J9 connector). Ensure that voltage is between +22.8V and 25.2V. If not, replace PDU.
Touchscreen Error	There is no communication between the CPU and the touchscreen controller.	Check connection between CPU and touchscreen (lower monitor). Verify that TOUCH RXD LED flashes on CPU board when you touch the sensor. Replace lower monitor.

Replacement Parts

BLU-KNIGHTS-000 REPLACEMENT PARTS

ITEM #	BLUBERI KEY	BLUBERI P/N	DESCRIPTION
1	115387	MECI7070125G1	RGB LED Strip (Side trims)
2	115389	MECI7070125G3	Blue LED Strip (Belly Door Logo)
3	115383	MECI245103029	External Printer Bezel
4	115385	MECI245103028	External Bill Validator Bezel
5	115380	MECI245103037	Internal JCM UBA BV Bezel
6	115378	MECI245103034	Internal MEI BV Bezel
7	115076 & 115075	MECI245101087 & MECI245101093	Internal Universal Printer Chute Kit
8	114753	MECI245102015	Armrest Urethane
9	110313	SWP032502BACRE0-K	Large Round Button Gamesman 1200 Series
10	110305	SWP029502BACRE0-K	Medium Rectangle Button Gamesman 1200 Series
11	110300	SWP026502BACRE0-K	Small Square Button Gamesman 1200 Series
12	000814	EMMEE760AF10DC12	Mechanical Meter
13	111458	ME187-68000XX000	Subwoofer Box V2
14	112413	ME187-60103XX000	Power Distribution Unit (PDU)
15	112358	BDCLAAMP21XP000TA-A	Audio Amplifier (AMP21XP)
16	109490	BDCLALED-CTRL00NA-A	RGB LED strip Controller
17	117147	MOL230WYU5RT2	23" Litemax Monitor (PCAP touch version)
18	116919	MOL230WYU5RA1	23" Litemax Monitor (No touch version)
19	115388	MECI245103025	MID Range Speaker Box (Main door Speakers)
20	115386	MECI7070125G2	Blue LED strip for Bill Validator Bezel
21	115386	MECI7070125G2	Blue LED strip for Printer Bezel
22	112112	SWP036103PACRA0-K	Main Door Detection Switch
23	112112	SWP036103PACRA0-K	Belly Door Detection Switch
24	103290	SWM018103QABXD0-K	Bill Validator Door Detection Switch
25	109853	SWP037103PACRA0-K	CPU Box Cover Detection Switch
26	15088	SWEC999PAL000	Clear Error/Stat Keyswitch
27	15090	SWEC999PAE000	Operator Menu Keyswitch
28	114073	MECI600019077	Main Door Lock CAM
29	114472	MECI245102043	Belly Door Lock CAM
30	114068	MECI640019467	Bill Validator Door Lock CAM
31	114473	MECI245101024	CPU Box Cover Lock CAM
32	115372	MECIFP108BS1B	Chassis FAN
33	114888	EMGS3090003RA0	Damper for Belly Door





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