RAPTORG2 Rev-E

Technical Manual

TEC-RE-02098
Version 5.0.0

2014-02-03

bluberi®

Version History

Version	Department	Date	Comments
1.0.0	Technical Documentation		Original version
2.0.0	Technical Documentation	2008-04-24	Revision
2.0.1	Technical Documentation	2008-08-06	Revision
3.0.0	Technical Documentation	2009-06-09	Contents and layout update
3.1.0	Technical Documentation	2009-10-08	SW warning update
3.2.0	Technical Documentation	2010-07-09	Hard reset information
4.0.0	Technical Documentation	2011-06-06	Contents and layout update
5.0.0	Technical Documentation	2014-02-03	Rev-E update

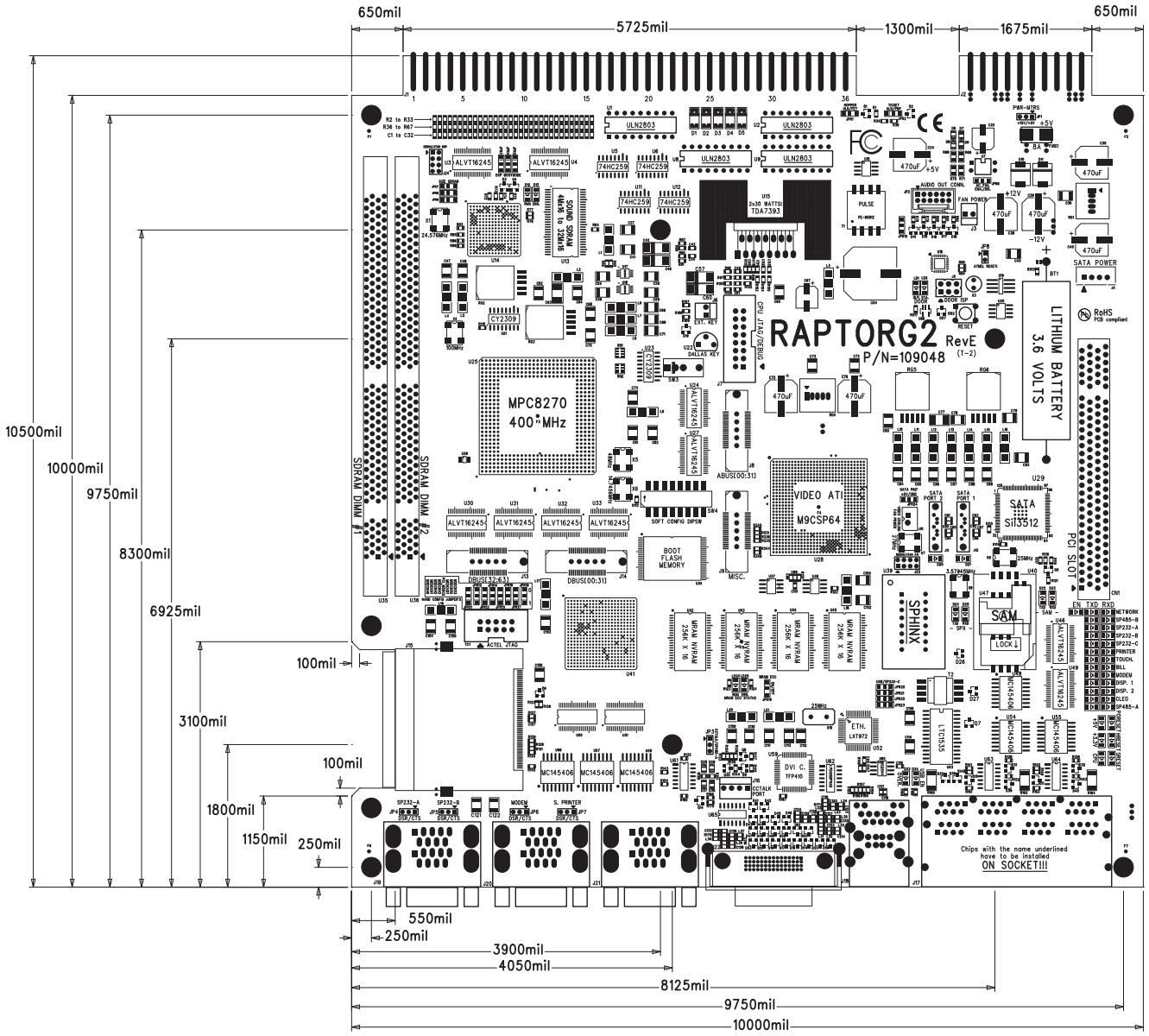
Contents

RAPTORG2 Technical Manual

Topic

This document provides technical information and specifications for the RAPTORG2 Rev-E gaming board.

Board Dimensions

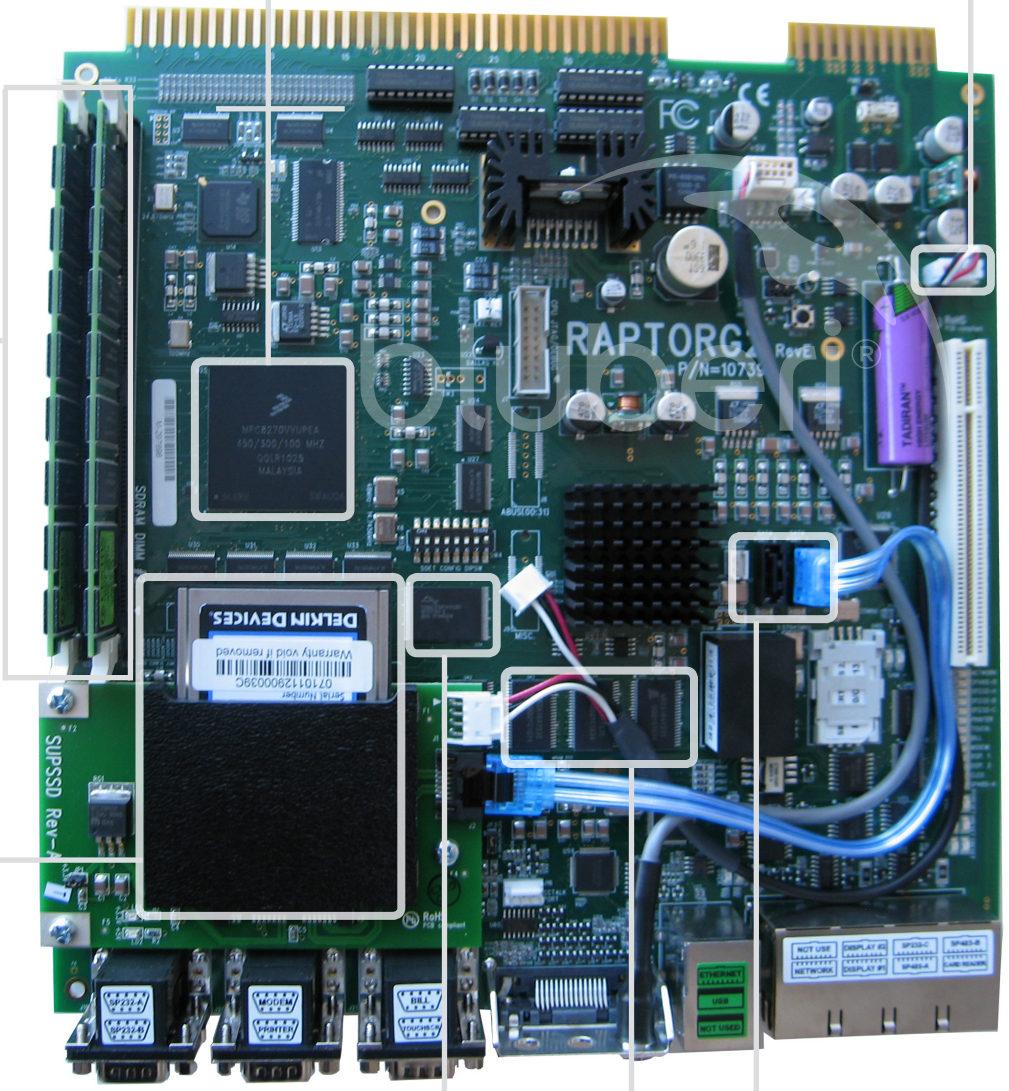


Processor and Memory

MPC8270 32-bit processor running at 400 MHz

Serial ATA power

Up to 1 GB of SDRAM memory (two standard 168-pin DIMM modules) with a 64-bit microprocessor interface



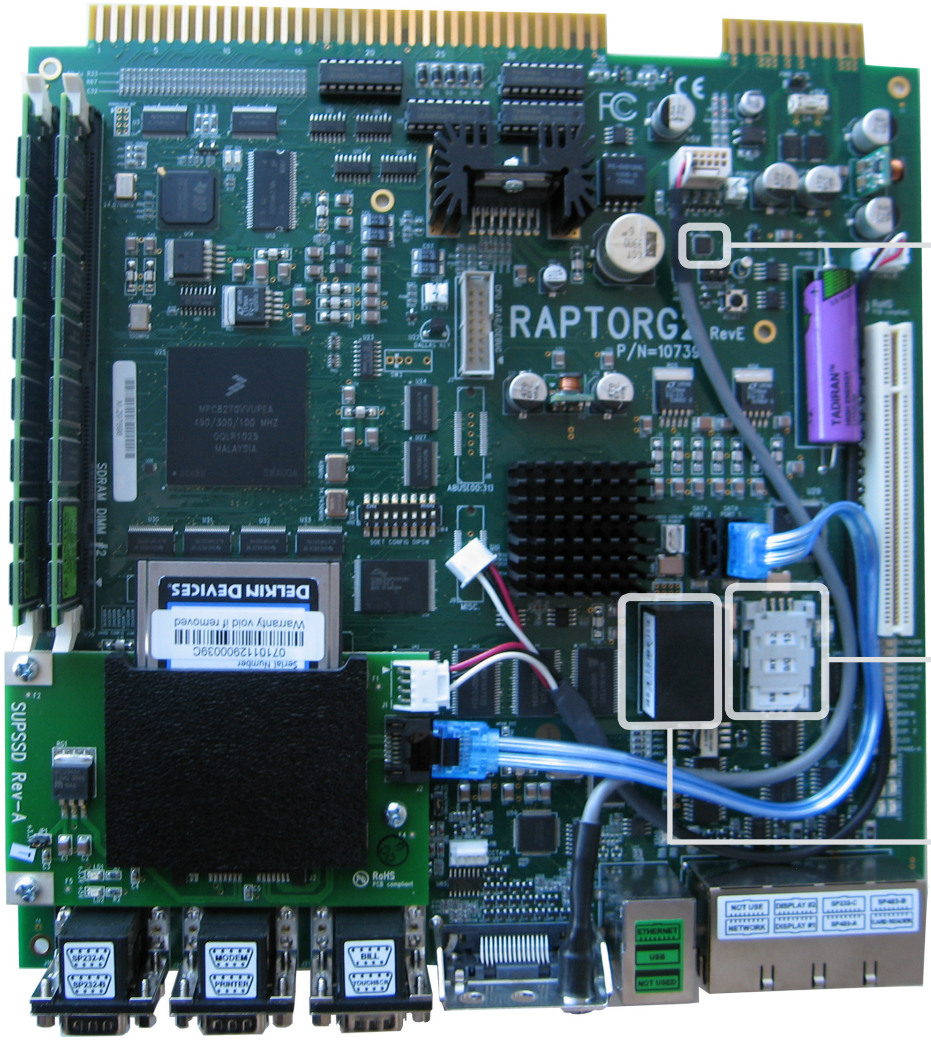
Solid State Drive reprogrammable on-board (8 GB)

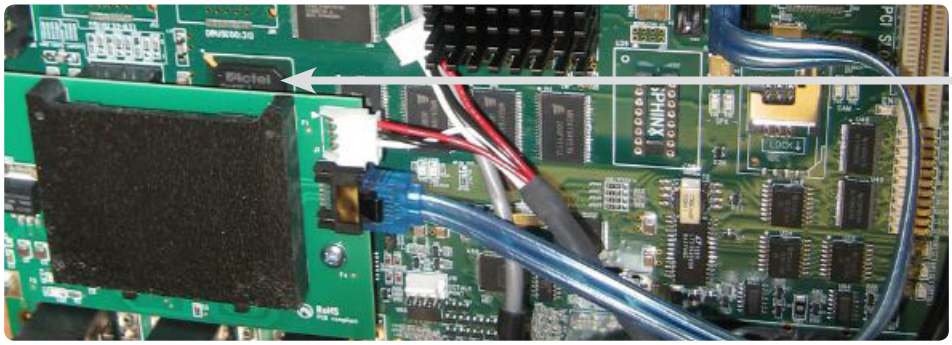
128 MB of flash memory for boot code

Up to 2 MB of MRAM with hardware lock featuring automatic ECC correction

Serial ATA for external data storage devices (hard drive, CD-ROM and DVD-ROM)

Security


Door tracking controller, monitoring access even when power is off, and keeping track of the date and time
SAM Card for protection against piracy and software modification
SPHINX for protection against piracy and software modification
DELKIN DEVICES
SUPSSD Rev-A


Actel ProAsic A3P600 for glue logic
Actel
SPHINX

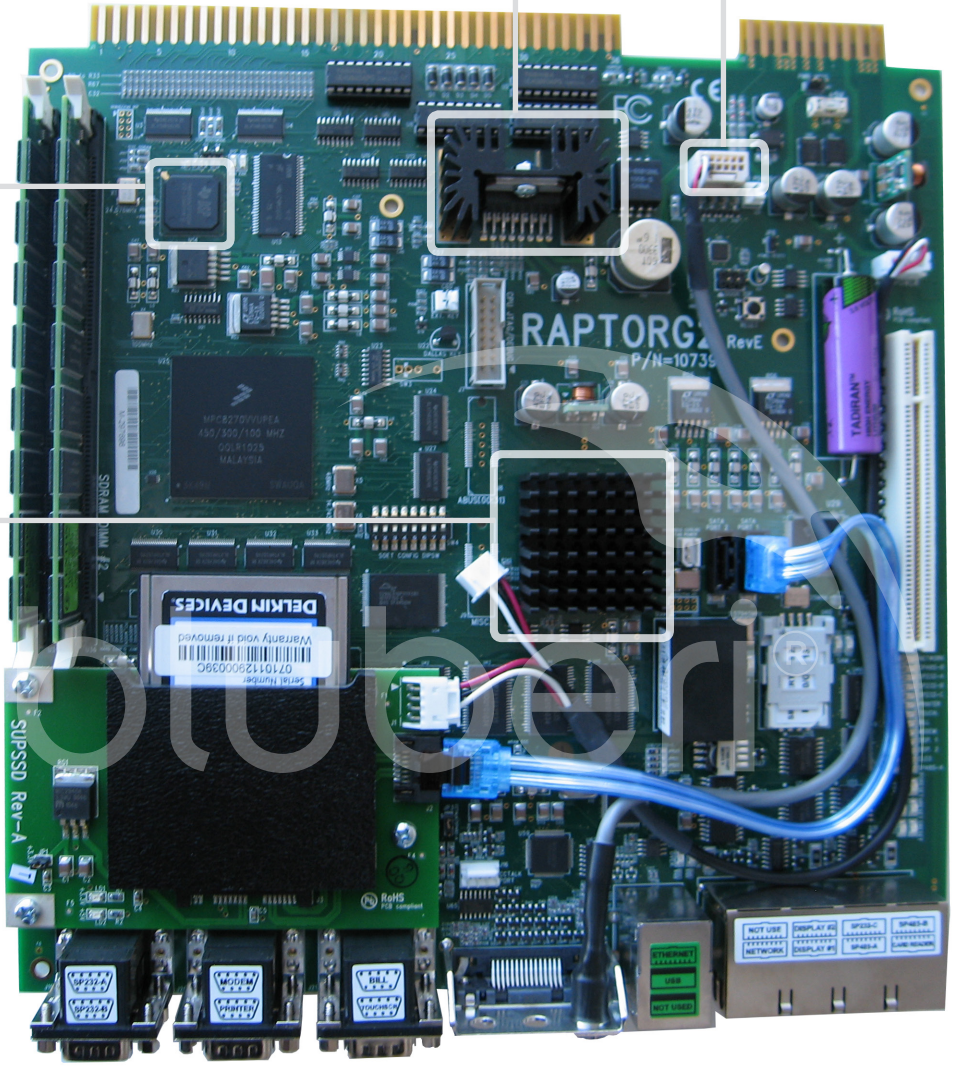
Sound and Video

SPDIF audio output option

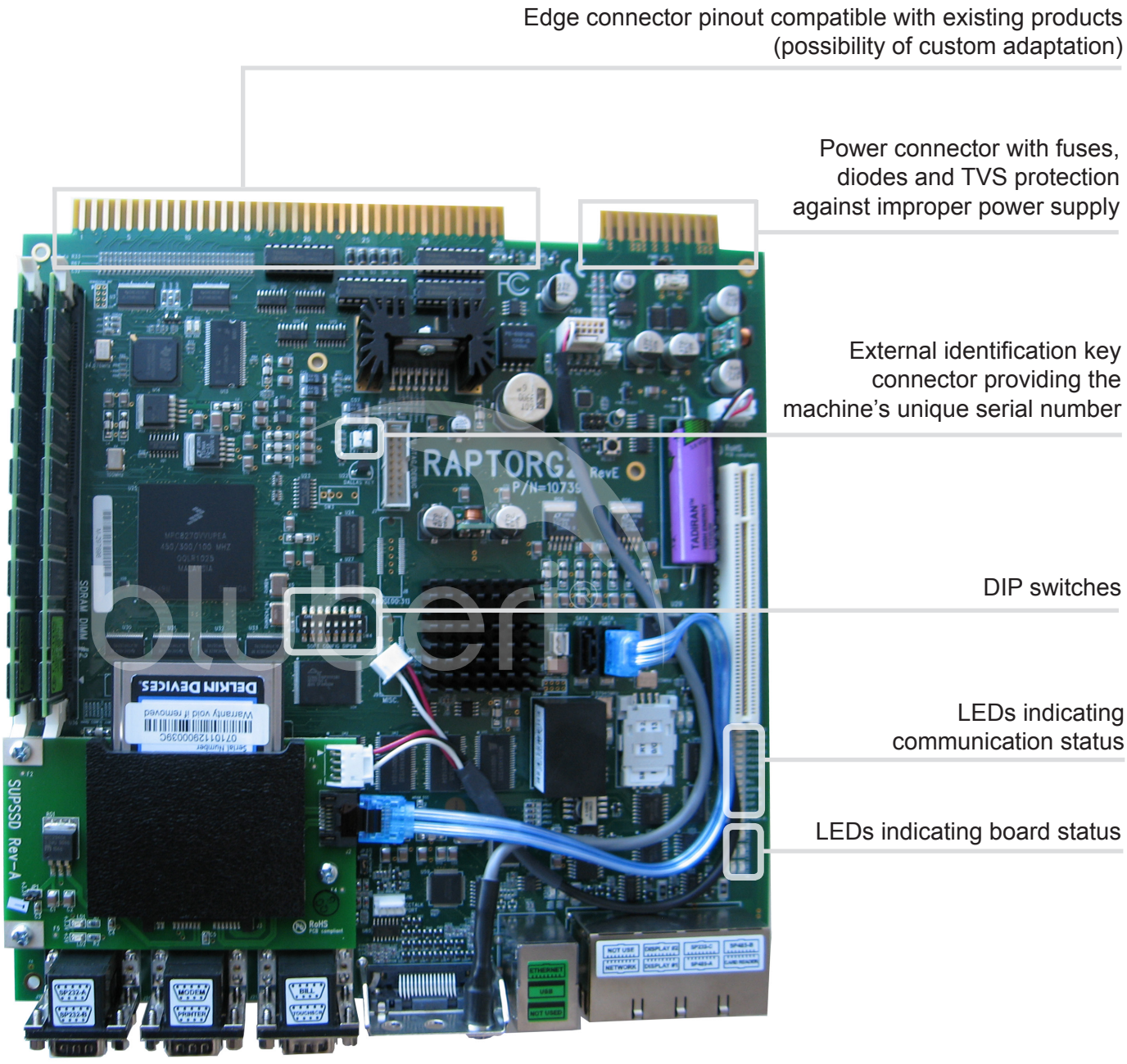
30-W stereo amplifier

Digital Signal Processor with 16 parallel channels able to play WAV and MP3

High-performance ATI Mobility Radeon M9-CSP64 video controller with 64 MB of internal video RAM



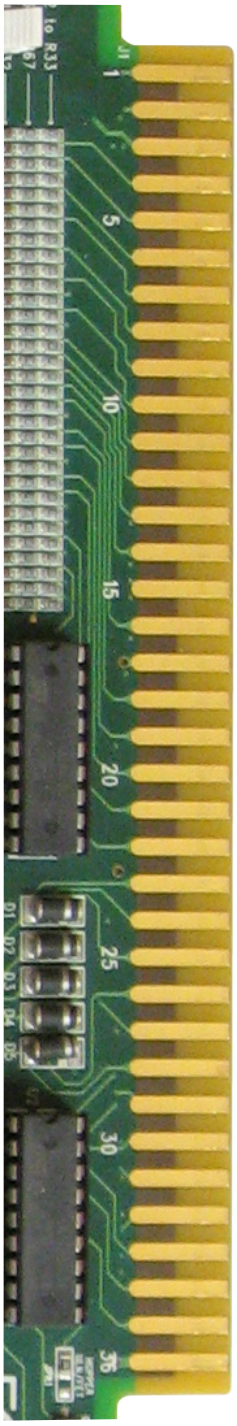
Inputs and Outputs



Edge Connector (J1)

The following table represents a typical RAPTORG2 pinout. It may differ from one game to another.

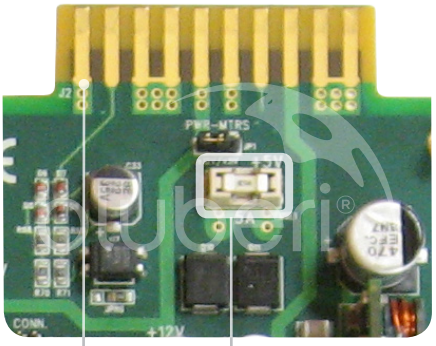
Part Side	Pin	Solder Side
	1	
	2	
Left_Speaker_Pos	3	
	4	Left_Speaker_Neg
Sw_Hopper_Sense	5	Right_Speaker_Neg
	6	
	7	Sw_Language
	8	
	9	
	10	Sw_Play
	11	Sw_Max_Bet
	12	Right_Speaker_Pos
	13	Sw_Cash_Door
	14	Sw_Logic_Door
Sw_Bill_Door	15	Sw_Main_Door
	16	Lp_Collect
+5 VDC (out)*	17	Hopper_Diverter
Sw_Slot #1	18	Sw_Slot #3
Sw_Slot #2	19	Enable_Coin
KeySw_Clear_Error	20	KeySw_Operator_Menu
	21	Sw_Collect
Sw_Hopper_Full	22	Sw_Hopper_Coin
Cash_In_Meter	23	GND
Cash_Played_Meter	24	
Meter_Spare	25	
Cash_Won_Meter	26	
Sw_Call_Attendant	27	
Cash_Paid_Meter	28	Lp_Win/Bell
	29	
	30	
	31	Lp_Play
Lp_Max_Bet	32	
	33	Lp_High_Tower_Red
Lp_Middle_Tower_White	34	Lp_Low_Tower_Blue
Lp_Call_Attendant	35	
GND	36	GND



* Do not use to power peripherals.

Power Connector (J2)

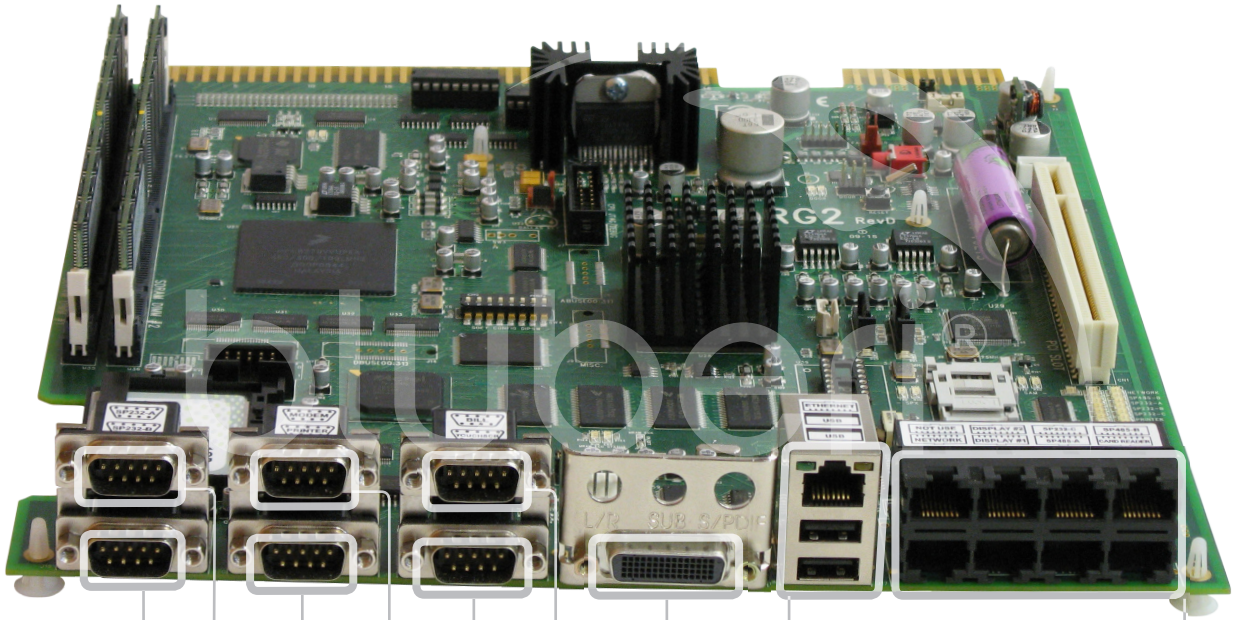
Part Side	Pin	Solder Side
GND*	1	GND*
AC+	2	AC-
+5 VDC (in)*	3	+5 VDC (in)*
+5 VDC (in)*	4	+5 VDC (in)*
+12 VDC (in)*	5	+12 VDC (in)*
Power_Meter**	6	Power_Meter**
POK	7	Hopper_Drive
-12 VDC (in)*	8	TIcket_Drive
GND*	9	GND*
GND*	10	GND*



* These pins require an independent wire coming directly from the cabinet power supply. Bluberi recommends using 18 Ga wire.

** Do not use to power peripherals other than meters.

Connectors



SP232-B

SP232-A
Secondary SAS

Printer

Modem
Primary SAS

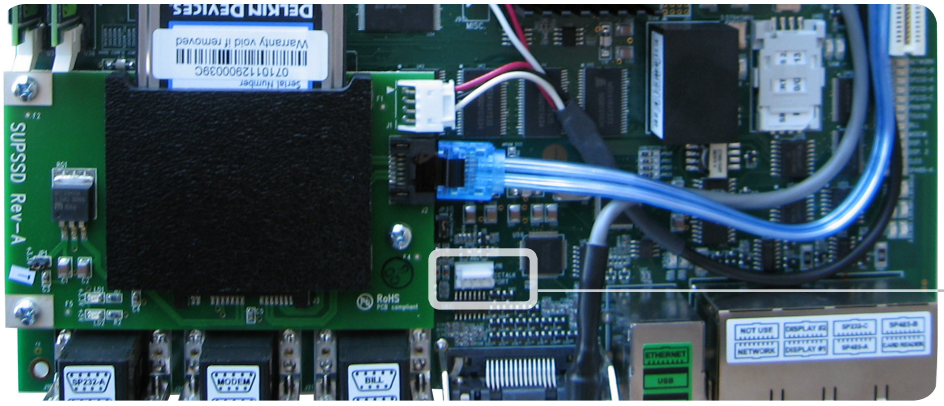
Touchscreen

Bill acceptor

Dual VGA/DVI Video Output (LFH60)

Ethernet 10/100 Mbps
USB
USB (non-functional)

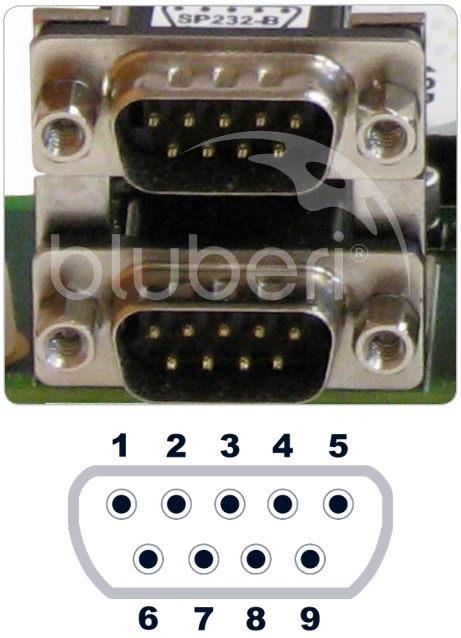
Not used	Display #2	SP232-C	SP485-B
Network	Display #1	SP485-A	Card reader



ccTalk connector

SP232 DB-9 Connectors (J19)

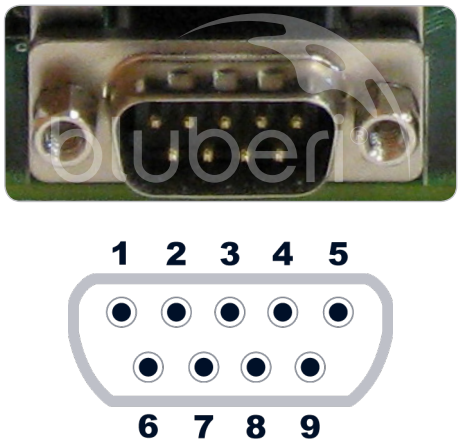
Pin	
1	Not connected
2	RxD
3	TxD
4	DTR
5	GND
6	DSR (according to the handshake-signal jumper setting)
7	RTS
8	CTS (according to the handshake-signal jumper setting)
9	Not connected



JP4 is the handshake-signal jumper for SP232-A and JP5 is the handshake-signal jumper for SP232-B.

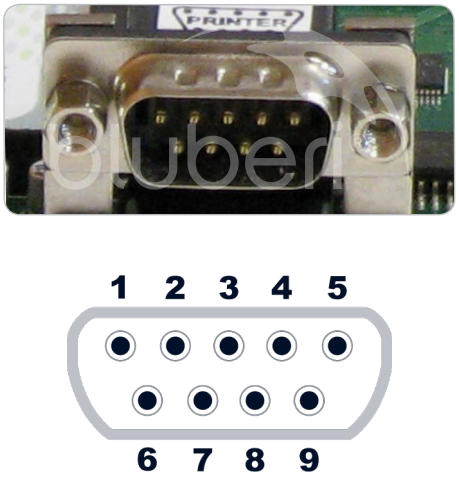
Serial-Printer Connector (J20-A)

Pin	
1	Not connected
2	RxD
3	TxD
4	DTR
5	GND
6	DSR (according to JP7 setting)
7	RTS
8	CTS (according to JP7 setting)
9	Not connected



Modem Connector (J20-B)

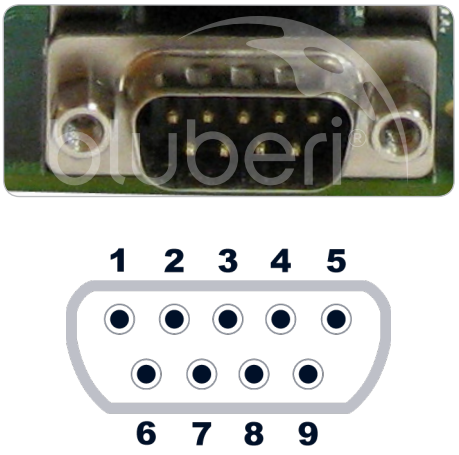
Pin	
1	Not connected
2	RxD
3	TxD
4	DTR
5	GND
6	DSR (according to JP6 setting)
7	RTS
8	CTS (according to JP6 setting)
9	Not connected



This RS-232 port may be the SAS-protocol primary port when required.

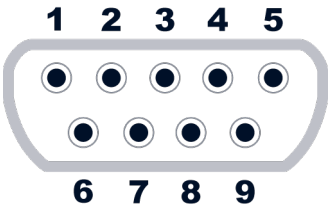
Touchscreen Connector (J21-A)

Pin	
1	Not connected
2	RxD
3	TxD
4	+12 VDC (through a 220-Ω resistance)
5	GND
6	Not connected
7	Not connected
8	Not connected
9	Not connected



Bill Acceptor Connector (J21-B)

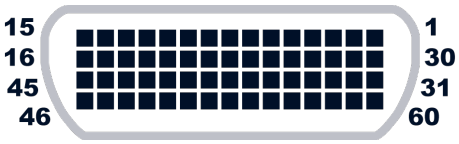
Pin	
1	+12 VDC
2	RxD
3	TxD
4	Bill enabled
5	GND
6	Not connected
7	Send
8	Interrupt
9	Not connected



LFH60 Video Connector (J22)

Pin	
1	GND
2	RGB1_Red
3	RGB1_Blue
4	GND
5	+5 VDC
6	RGB1_CLK
7	RGB1_DATA
8	GND
9	RGB2_CLK
10	RGB2_CLK
11	+5 VDC
12	GND
13	RGB2_Blue
14	RGB2_Red
15	GND
16	DVI2_TX0+
17	DVI2_TX0-
18	DVI2_TX1+
19	DVI2_TX1-
20	DVI2_TX2+
21	DVI2_TX2-
22	Not connected
23	Not connected
24	Not connected
25	DVI1_TX2+
26	DVI1_TX2+
27	DVI1_TX1+
28	DVI1_TX1-
29	DVI1_TX0+
30	DVI1_TX0-

Pin	
31	DVI1_TXC+
32	DVI1_TXC-
33	GND
34	GND
35	GND
36	DVI1_HotPlug
37	Not connected
38	Not connected
39	Not connected
40	DVI2_HotPlug
41	GND
42	GND
43	GND
44	DVI2_TXC-
45	DVI2_TXC+
46	GND
47	RGB2_Green
48	Not connected
49	GND
50	RGB2_HSync
51	RGB2_VSync
52	GND
53	Not connected
54	GND
55	RGB1_VSync
56	RGB1_HSync
57	GND
58	Not connected
59	RGB1_Green
60	GND

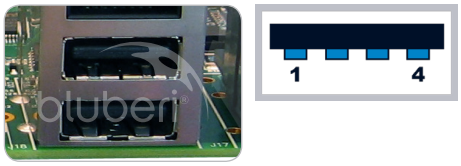


Ethernet 10/100 Mbps Connector (J18-A)

Pin	
1	Tx+
2	Tx-
3	Rx+
4	GND
5	GND
6	Rx-
7	GND
8	GND

USB Connectors (J18-B)

Pin	
1	+5 VDC
2	D-
3	D+
4	GND



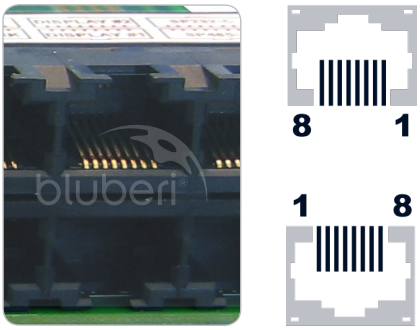
The bottom USB port is reserved for future use.

Network Connector (J17-A)

Pin	
1	Tx+
2	Tx-
3	Rx+
4	GND
5	GND
6	Rx-
7	Not connected
8	Not connected

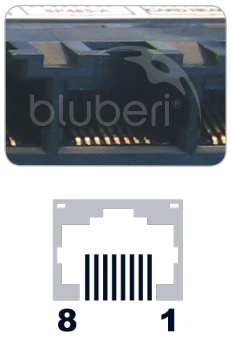
Display Connectors (J17-C and J17-D)

Pin	
1	Not connected
2	Not connected
3	TxD
4	RTS
5	RxD
6	CTS
7	GND
8	Not connected



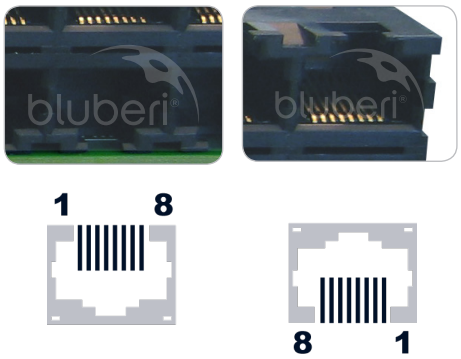
SP232-C Connector (J17-F)

Pin	
1	Not connected
2	RTS
3	TxD
4	GND
5	GND
6	RxD
7	CTS
8	Not connected



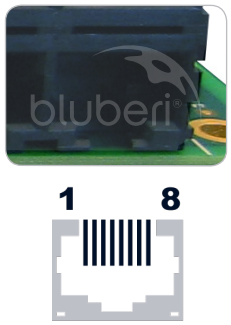
SP485 Connectors (J17-E and J17-H)

Pin	
1	Not connected
2	Tx-
3	Tx+
4	GND
5	GND
6	Rx+
7	Rx-
8	Not connected



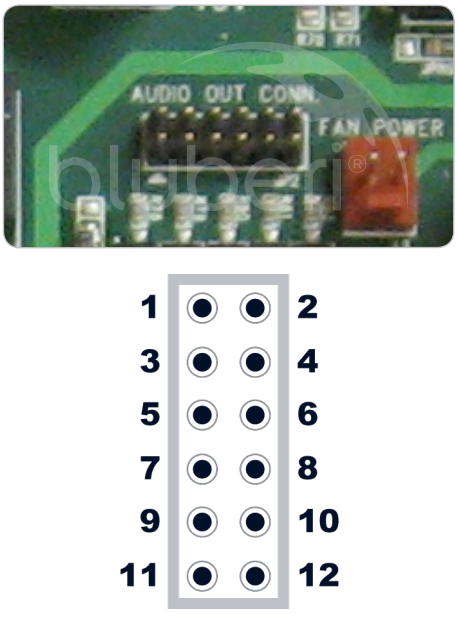
Card Reader Connector (J17-G)

Pin	
1	Not connected
2	RTS
3	TxD
4	GND
5	GND
6	RxD
7	CTS
8	Not connected



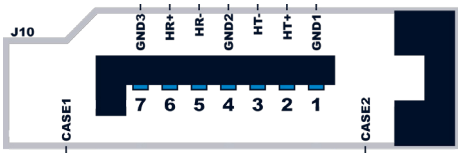
Audio Connector (JP2)

Pin	
1	Audio right
2	Audio left
3	GND
4	GND
5	Subwoofer right
6	Subwoofer left
7	GND
8	GND
9	SPDIF+
10	SPDIF-
11	Not connected
12	Key



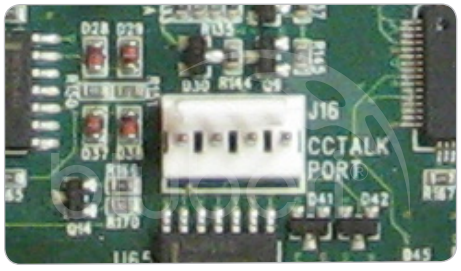
Serial ATA Connectors (J11 and J12)

Pin	
1	GND
2	Tx+
3	Tx-
4	GND
5	Rx-
6	Rx+
7	GND



ccTalk Connector (J16)

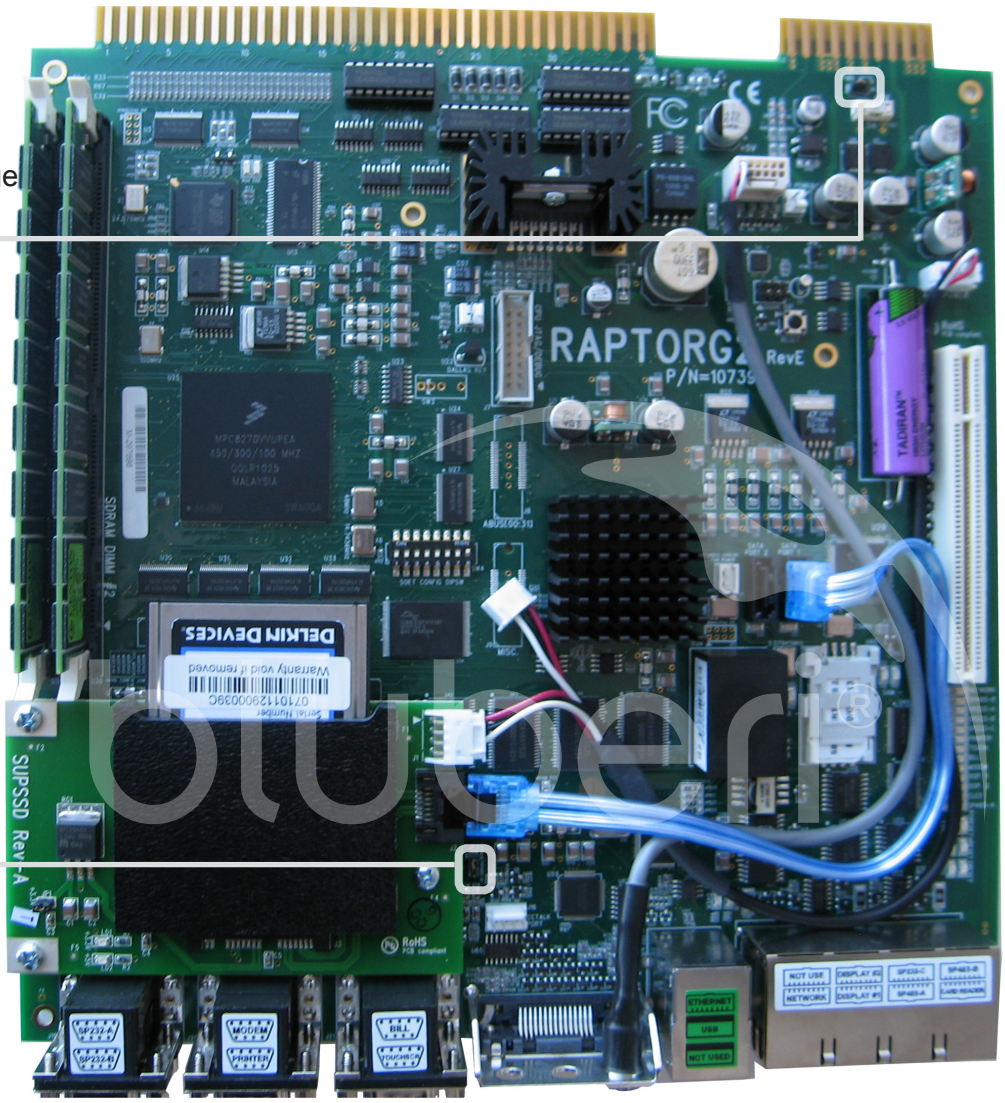
Pin	
1	ccTalk data
2	GND
3	Not connected
4	+12 VDC



Configuration

JP1: Hardware meter voltage (+5 VDC or +12 VDC)

JP3: Port selection ccTalk or SP485-A

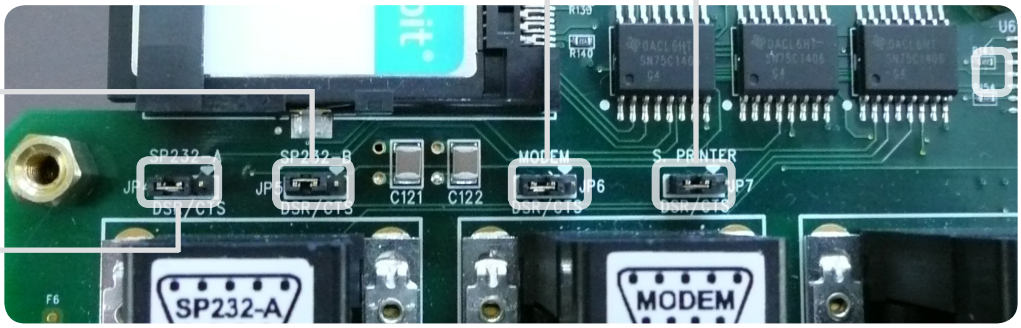


JP6: Modem handshake signal DSR or CTS

JP7: Printer handshake signal DSR or CTS

JP5: SP232-B handshake signal DSR or CTS

JP4: SP232-A handshake signal DSR or CTS



Technical Characteristics

DIP Switches

DIP switches are read during the boot sequence.

DIP switch 1

> The RAPTORG2 board must be restarted after each DIP-switch modification.

DIP Switch 1	
Off	Normal start-up
On	Remains in the bootstrap loader after start-up.

DIP Switch 2	
Off	The IP address is requested from a DHCP host.
On	The 192.168.10.2 IP address is used.

DIP Switch 8	
Off	Normal reset
On	Hard reset ⚠ Only available on request for specific games. When the DIP switch is in the ON position at startup, the application clears the backup RAM and resets to the default configuration.

Door Controller Status LEDs

Two LEDs indicate the RAPTORG2 ATMEL door controller status.

LED	Meaning
SLP	Indicates the recording of an event.
STA	Lights briefly to indicate an error.

Board Status LEDs

Six LEDs indicate the RAPTORG2 board status.

PORESET	HRESET	SRESET
+5V	+3.3V	CPU

LED	Meaning
PORESET	Indicates a reset due to power cycling.
HRESET	Indicates a hard reset occurrence.
SRESET	Indicates a soft reset occurrence.
+5V	Indicates that the +5 VDC power source is connected to the board.
+3.3V	Indicates that the +3.3 VDC power source is connected to the board.
CPU	Flashes following a specific pattern to indicate errors.

DSP Status LEDs

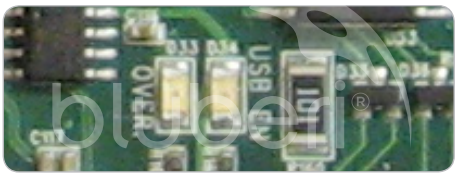
Two LEDs indicate the RAPTORG2 DSP status.

ERR	RUN

LED	Meaning
ERR	Lights briefly to indicate an error.
RUN	Indicates that the DSP is powered.

USB Status LEDs

Two LEDs indicate the RAPTORG2 USB status.

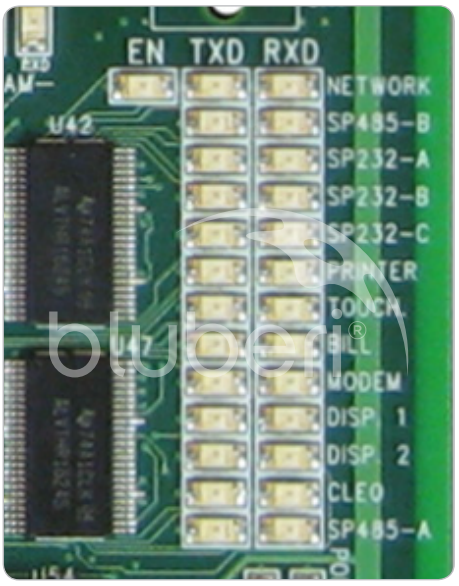


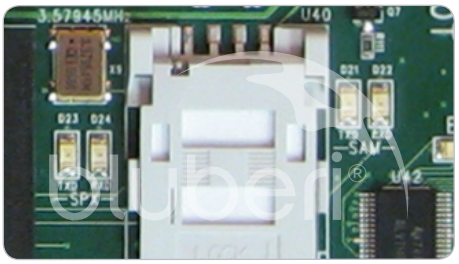
LED	Meaning
OVER.	Lights when the port is overloaded (current > 500 mA).
USB EN	Indicates that the USB port is powered.

Communication Status LEDs

Fifteen pairs of LEDs indicate the RAPTORG2 ports communication status.

The port is clearly identified beside each pair of LEDs.

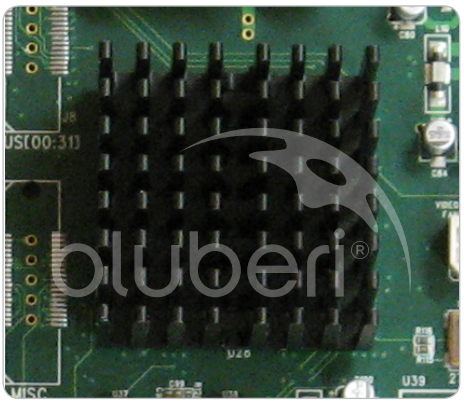




LED	Meaning
RXD	The corresponding port receives data.
TXD	The corresponding port transmits data.
EN	The RAPTORG2 is momentarily taking control of the network bus to send data.

Video Controller

- 2D and 3D engines
- All VGA resolutions supported, and run-time adjustable by software
- Up to 32-bit colors for graphics
- Possibility of two monitors simultaneously, each available in analog RGB or DVI digital interface
- 64 MB of internal video memory, multiple video pages



Network

A local network connects the gaming machines to the main controller board through an ETHERNET 10/100 Mbps link isolated from electric surge.

Lithium Battery

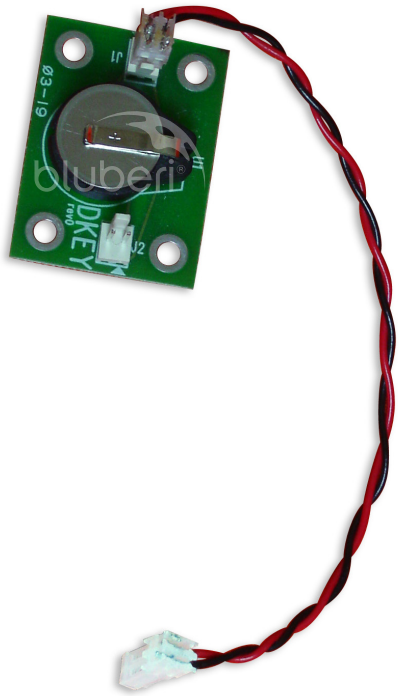
The board lithium battery provides continuous power to the door tracking controller while the RAPTORG2 is powered down.

Size	Power	Voltage
AA	1900 mAH	3.6 V

Never depress a push-button switch unless instructed to do so by our Technical Support Department or their representatives.

Identification Key

The DALLAS DS1990 of Maxim Integrated Products is a Dallas Semiconductor MultiKey iButton device. It is a button-shaped IC communicating through a complex one-wire bus protocol. It contains a unique serial number used by management systems to identify a gaming machine. It is inserted in the small DKEY board fastened on the cabinet frame and linked to the external identification key connector (J6).



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

Contact Us

If you have any question, comment or feedback, please use the contact details provided below.

Bluberi Gaming Technologies Inc.

2120, rue Letendre
Drummondville (Québec) J2C 7E9
CANADA

819.475.5155
1.800.720.5155 (U.S. toll-free number)
819.475.5156
www.bluberi.com

Technical Support

1.866.THE.GAME (1.866.843.4263)
support.bluberi.com
support@bluberi.com