ADVANTECH DPX-S450 CPU

User manual

Version

1.0.0

Department

TEC-EL-04290

Creation date

2022-08-11

Audience

QA/Support/R&D/Certification

BLUBERI

Version History

Version	Department	Initials	Date	Comments
1.0.0	R&D	E.B.	2022/08/11	First Draft
1.0.1	R&D	E.B	2022/08/22	Added lock installation

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Topic

This document provides technical information and specifications for the Advantech DPX-S450 CPU gaming board.

Figure 1: DPX-S450 Board enclosure

Enclosure dimension

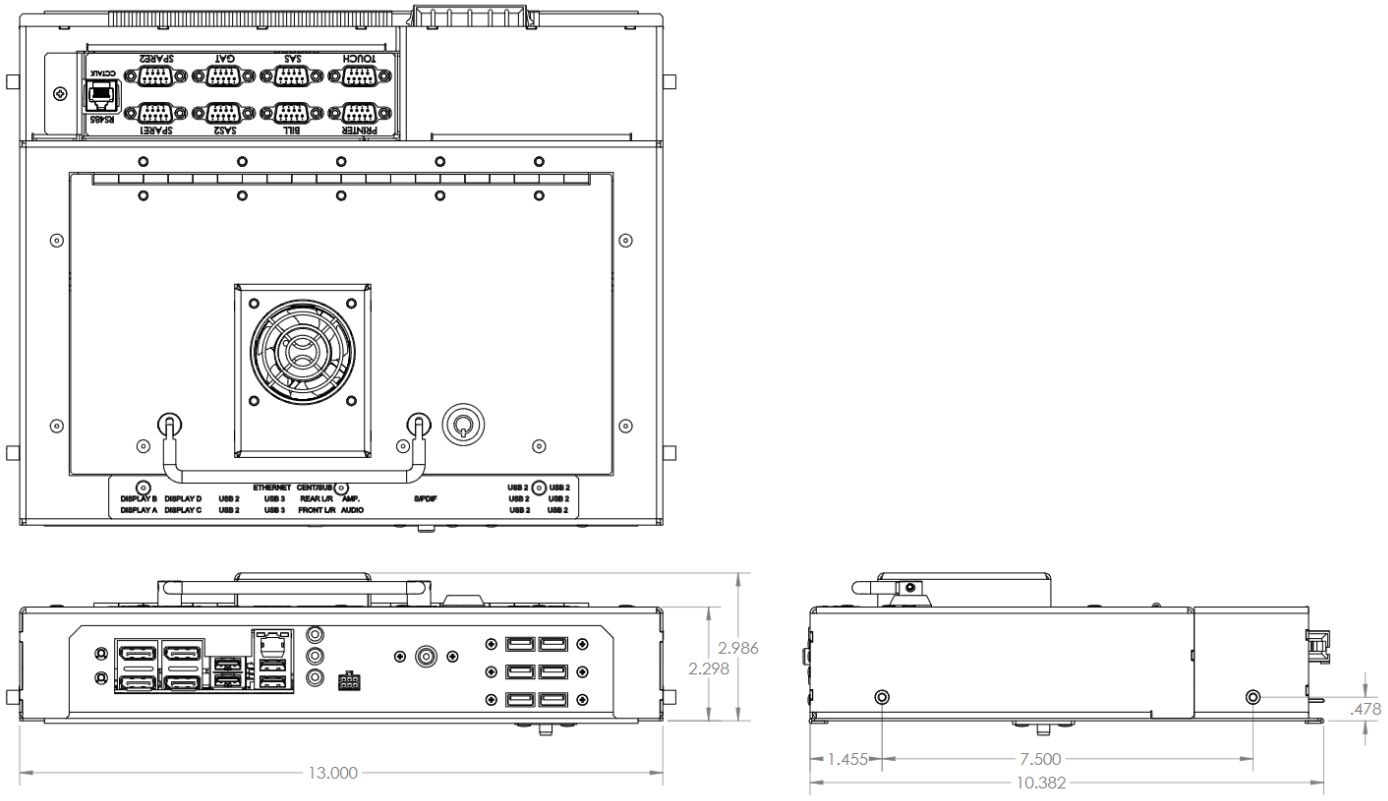


Figure 2: Enclosure dimension

Block Diagram

The Bluberi DPX-S4500 enclosure contains two electronics boards:

ADP-SPIADVAN

This board is used to interface the DPX-S450 board to the Bluberi edge connector standard, on that wait this board can be install in any Bluberi EGM.
This board also add support for SAM card and includes all connectors to interface with gaming peripherals using the same pinout as our previous board generation.

Advantech DPX-S450

This board is a off the shelf board sailed by Advantech, this board is designed specifically for the gaming industry.

Block diagram

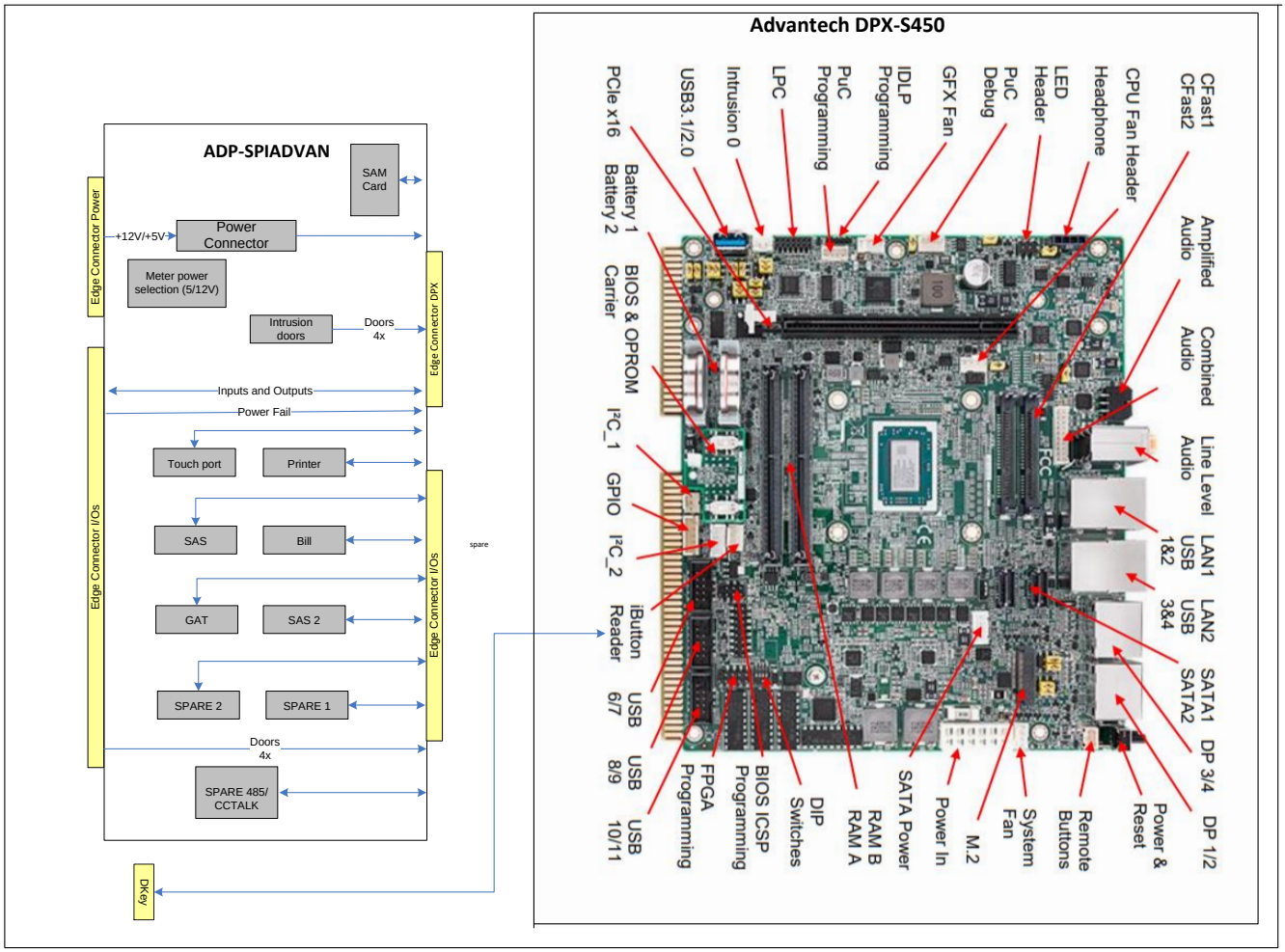


Figure 3: DPX-S450 Block diagram

General Description

Chipset
AMD Ryzen™ SoC V1807B (Quad core APUs up to 3.8Ghz, up to 2MB L2 cache,Vega GPU, 11 compute units, 54W).

Display
4x Digital Display Interface (DDI) on Display Port connector. Each DDI support the Dual-Mode Implementation (also called DP++). This feature gives the option to link the monitor with a Display Port cable or a passive Display Port to DVI cable/adapter.

Sound
High Definition audio codec ALC888 Class D 2.1 amplifier system, output 15W per channel (FL, FR, LFE) with selectable dynamic bass boost.
Front I/O Panel & On-board Audio connectors FL-Out, FR-Out, LFE-Out, RL-Out, RR-Out, Line In L&R, MIC In, SPDIF In, SPDIF Out (x2)
PC speaker (buzzer).

USB
2x USB 3.0 ports available on the front panel. The maximum allowable current to be drained from the USB 3.0 ports is limited to 1.1A.
8x USB 2.0 ports available on the front panel. The maximum allowable current to be drained from the USB 2.0 ports is limited to 500mA.
1x USB 3.0 available in the CPU box. The maximum allowable current to be drained from the USB 3.0 ports is limited to 1.1A.

Ethernet
1x 10/100/1000 MBPS Integrated Ethernet Controller (front panel connector RJ45).
Fully compliant with IEEE 802.3, 802.3u and 802.3ab

Serial ATA /M.2
2x CFAST sockets supporting SATA 3.0 (data transfer up to 6GB/s)
1x M.2 slot, PCIe x2

APU Memory (DDR4)
Dual channel DDR4-3200MHz SODIMM Sockets (up to 2x32GB memory).

BIOS
AMI BIOS.
The DPX-S450 supports a BIOS carrier PCB which can include both the BIOS and OPROM SPI

Serial Ports
8x RS232 on male DB9 connector (Printer, SAS, Touchscreen, Bill, GAT, SAS2, SPARE1, SPARE2).
1x RS485 on modular jack connector (Spare485***).
1x CCTALK*** on modular jack connector.
*** Share the same modular jack

DOORs Controller
The system is responsible to monitor up to 8 different doors events.
Real Time Clock chip.
Lithium Battery, CR2477N 3.0V, 950 mAh.

Memories
8MBytes battery backed SRAM.
Use Lithium Battery, CR2477N 3.0V, 950 mAh.

Security
8-pins SIM card connector (push in/push out) to host a proprietary security card (SAM).

Miscellaneous
External 1-wire interface on a molex connector on the back of the CPU enclosure.
Pack of 4 dipswitch
Power loss detection (POK).

BIOS:

BIOS flash chipset is installed on a small PCB module to allow easy removal and verification (signature) from required jurisdiction.

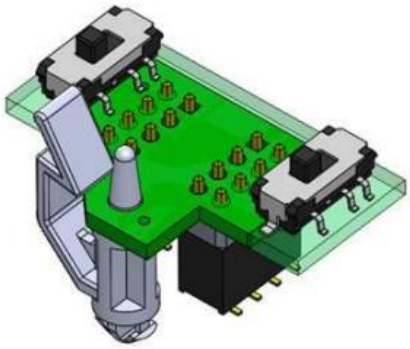


Figure 4: BIOS module

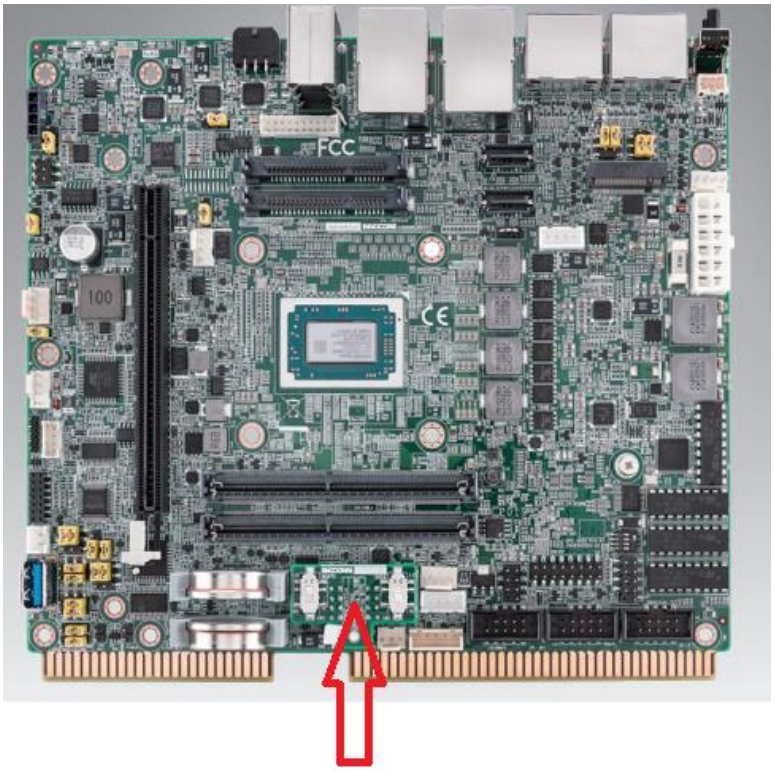


Figure 5: Bios module location

Removing the BIOS PCB module

To remove the SPI carrier PCB from the main board ease the plastic securing clip to one side and carefully removing the carrier vertically. Refitting is the opposite of extraction.

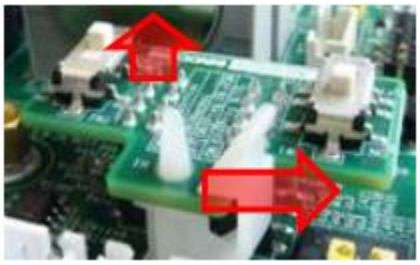


Figure 6: Bios removal

DPX-S450 Jumpers Settings

Before you proceed with the DPX-S450 CPU installation, make sure all the jumpers are properly configured.

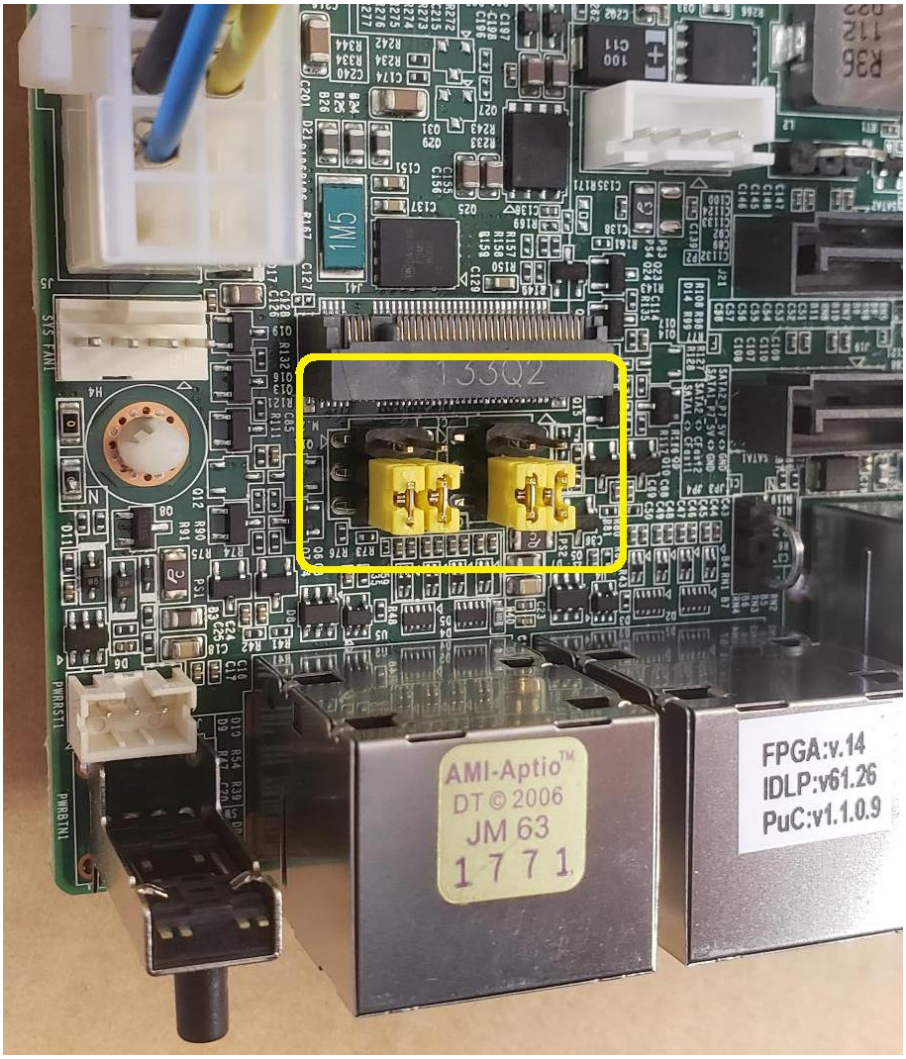


Figure 7: Sata configuration

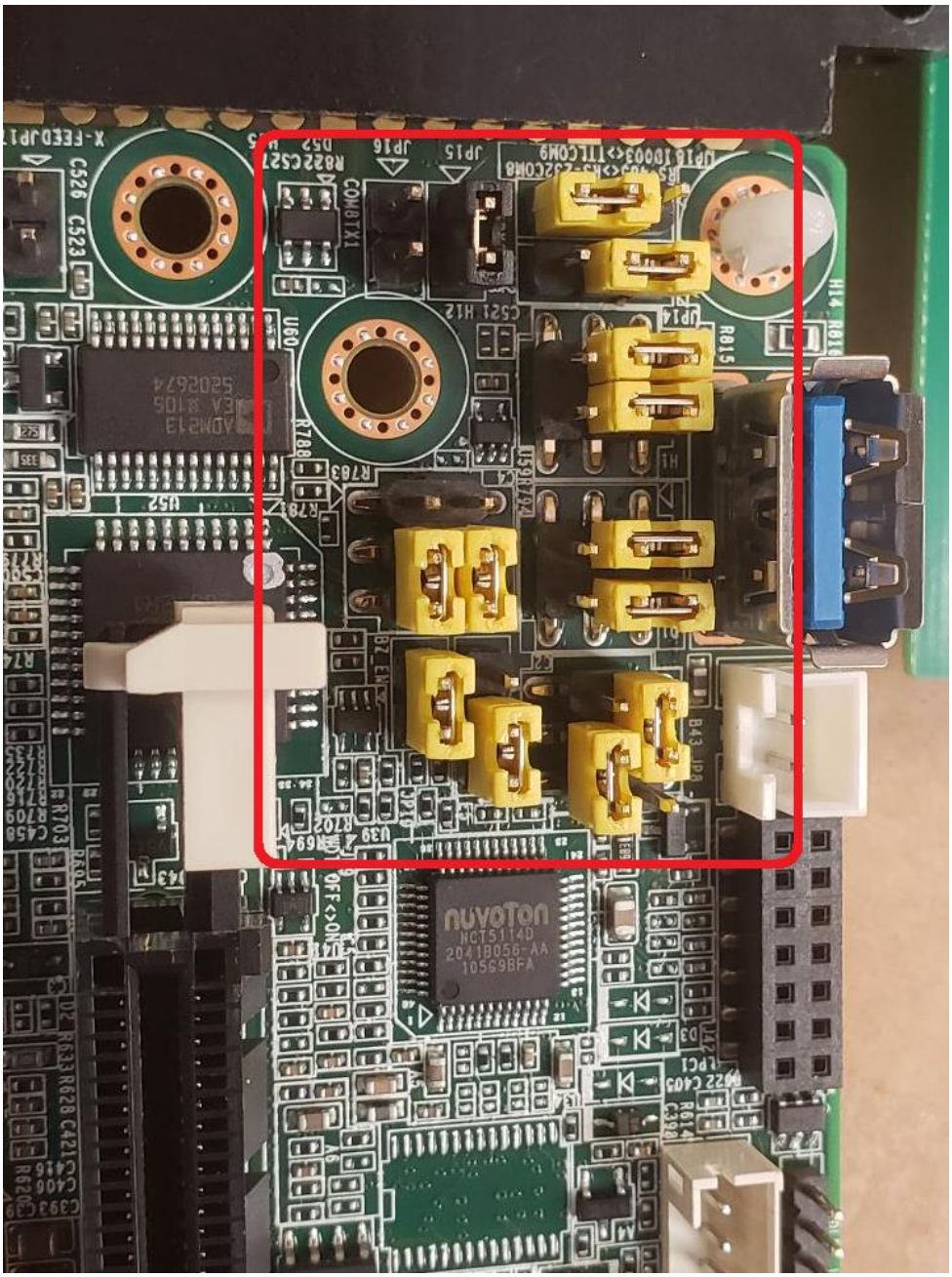


Figure 8: Serial ports configurations

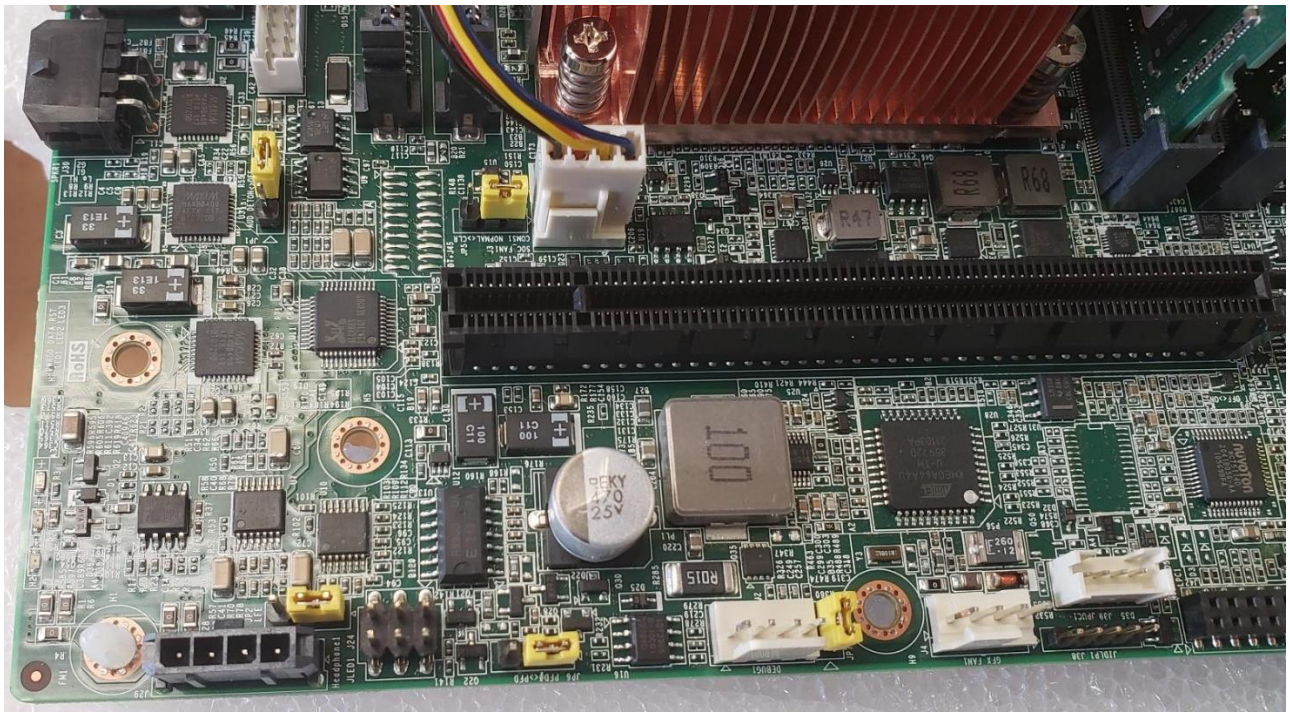


Figure 9: Miscellaneous configuration

Security

Door Tracking Controller

Up to eight (8) door access monitoring inputs even when power is off and keeping track of the date and time (four available from edge connector and four from 24pins drawer connector).

SAM Card

Software protection against piracy and software modification.

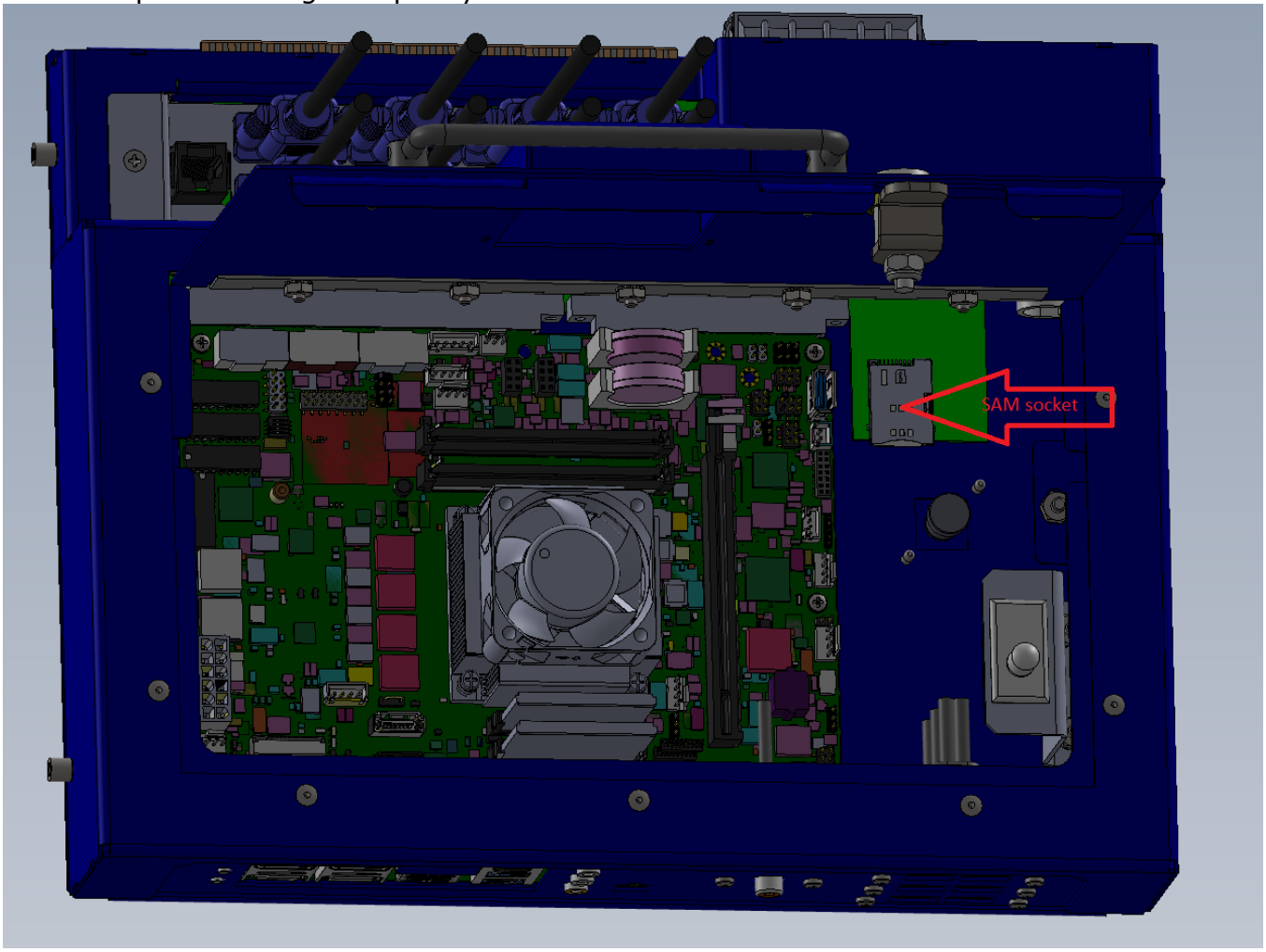


Figure 10: SAM card location

Sound and Video:

DPX-S450 comes with four native DP++ (Display Port) digital interfaces. DP++ interface can be used with an appropriate passive adaptor cable to get DVI or HDMI. An active adaptor is also available on the market to convert display port signal to VGA (HD15).

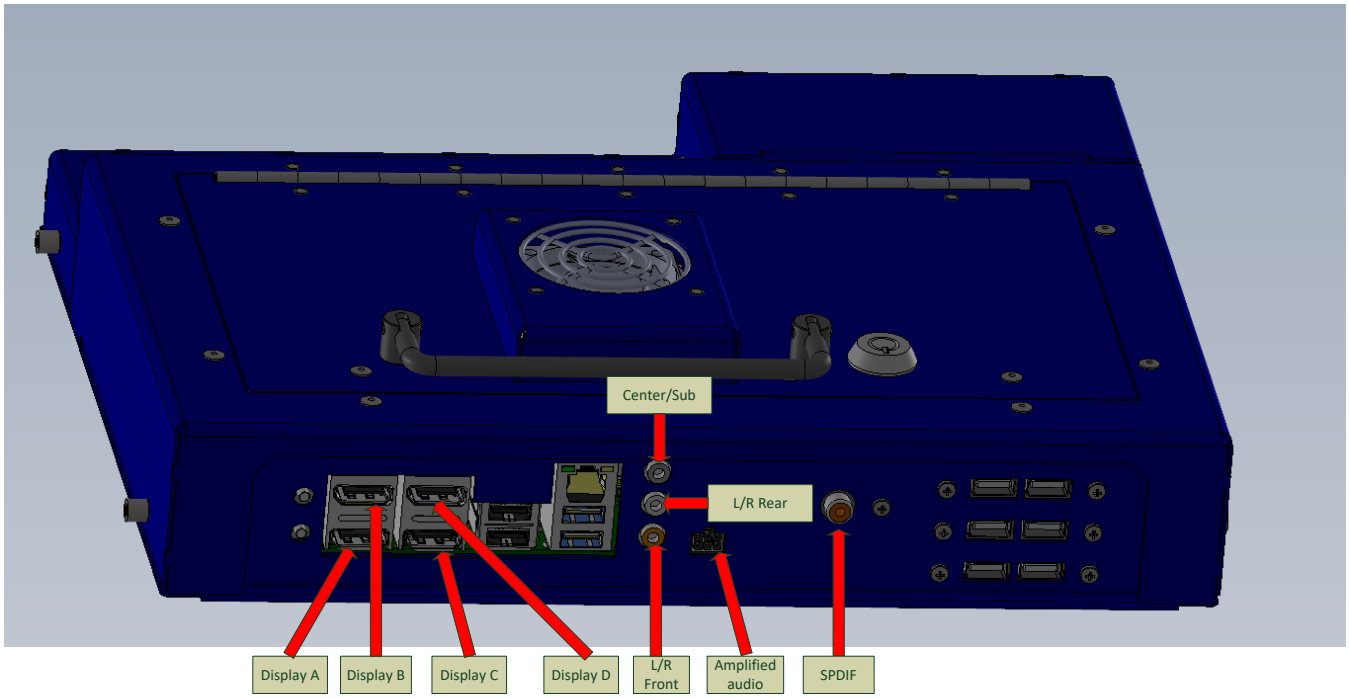


Figure 11: Video and Sound connectors

A 1/8” jack for the front left and right and a S/PDIF RCA are available in the front panel. There is also an amplified audio output available on the front connector, that provide 15W per channel.

Amplified audio Specification

The on-board 2.1 audio amplification is provided using chip down MAX98400 class D amplifiers. The audio amplifiers are configured to provide a maximum of:

- 2.1 Audio (FL, FR and LFE) 15W + 15W + 15W into 8 ohms speakers (8 ohm is the minimum supported speaker impedance).
- The amplifiers are gain limited to achieve their rated output when driven by a 1V p-p sine wave at 1Khz. Allowance is made to overdrive the input up to 2Vp-p from the codec at the end users discretion (via OS settings).

The amplified audio connector is a 90º 6 pin Molex Microfit 3.0 connector.

Signal	Pin	Pin	Signal
FL+	4	1	FL-
FR+	5	2	FR-
LFE+	6	3	LFE-

Figure 12: Amplified audio connector.

Inputs and Outputs

Edge connector

Figure 13: ADP-SPIVAN edge connector

Available from edge connector:

31x digital inputs and 31x digital outputs (500mA, 50V max)
4x door monitoring inputs (4 additional available on drawer connector)
6x dedicated mechanical meters outputs
Power output for mechanical meters

20 PINS-EDGE (POWER)

Part Side	Pin	Solder Side
GND*	1	GND*
-	2	-
+5VDC*	3	+5VDC*
+5VDC*	4	+5VDC*
+12VDC*	5	+12VDC*
PWR_METERS**	6	PWR_METERS**
POK	7	HOPPER ENABLE
-	8	TICKET
GND*	9	GND*
GND*	10	GND*

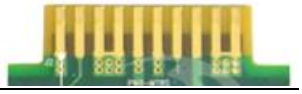


Figure 14: 20 pins edge connector

* These pins require an independent wire coming directly from the cabinet power supply or PDU. We recommend using 18Ga wire.

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

72 PINS-EDGE (FULL PINOUT)

Part Side	Pin	Solder Side
SPARE METER #2	1	OUT1S
OUT2P	2	OUT2S
-	3	OUT3S
IN4P	4	-
SW HOPPER SENSE	5	-
IN6P	6	IN6S
IN7P	7	IN7S
IN8P	8	IN8S
IN9P	9	IN9S
IN10P	10	IN10S
IN11P	11	IN11S
IN12P	12	-
IN13P	13	SW CASH DOOR
IN14P	14	SW LOGIC DOOR
SW BILL DOOR	15	SW MAIN DOOR
IN16P	16	OUT16S
+5VDC (OUT)*	17	HOPPER DIVERTER
SW SLOT #1	18	SW SLOT #3
SW SLOT #2	19	COIN ENABLE
KEYSW CLEAR ERROR	20	KEYSW OPERATOR MENU
IN21P	21	IN21S
SW HOPPER FULL	22	SW HOPPER COIN
CASH IN METER	23	GND
CASH PLAYED METER	24	OUT24S
SPARE METER #1	25	IN25S
CASH WON METER	26	IN26S
IN27P	27	OUT27S
CASH PAID METER	28	OUT28S
OUT29P	29	OUT29S
OUT30P	30	OUT30S
OUT31P	31	OUT31S
OUT32P	32	OUT32S
OUT33P	33	CANDLE 3H/2L
CANDLE 3M/2H	34	CANDLE 3L
OUT35P	35	IN35S
GND	36	GND

* Do not use to power peripherals.

Figure 15: 40 pins edge connector

Expansion Drawer Connector

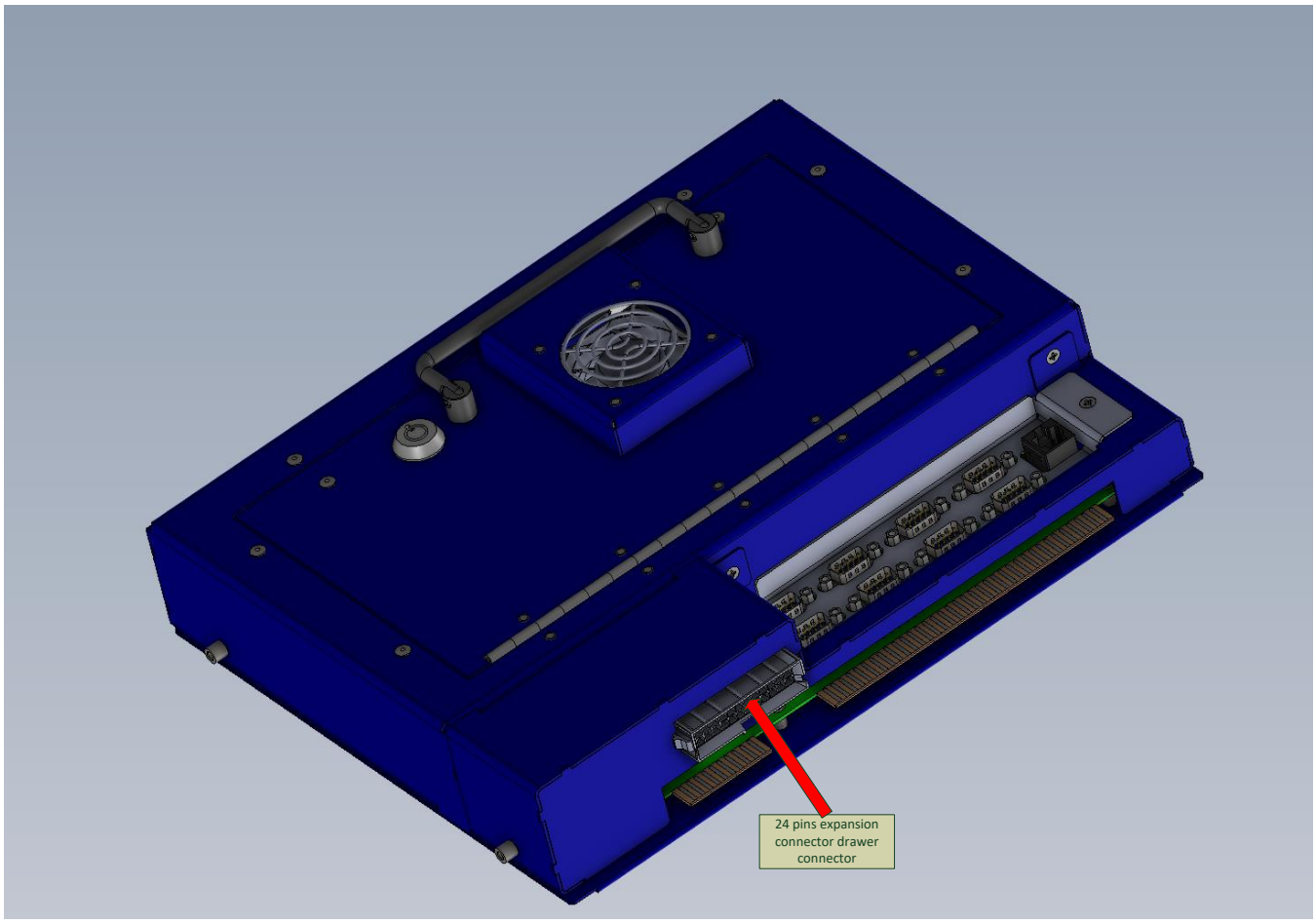
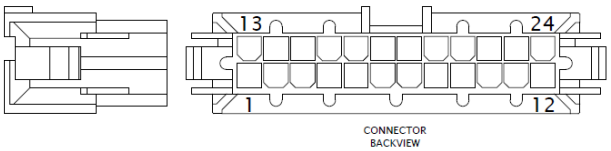


Figure 16: 24 pins drawer connector

24-PINS DRAWER CONNECTOR

PIN	FUNCTION
1	GND
2	+12V
3	GND
4	+5VDC
5	GND
6	+5VDC
7	GND
8	POK PSU
9	+5VSB PSU
10	+12V
11	SW DOOR5
12	DKEY+
13	GND
14	-12VDC
15	GND
16	SW DOOR6
17	SW DOOR7
18	-
19	GND
20	SW DOOR8
21	+5VDC
22	+5VDC
23	-
24	DKEY-



Back connections

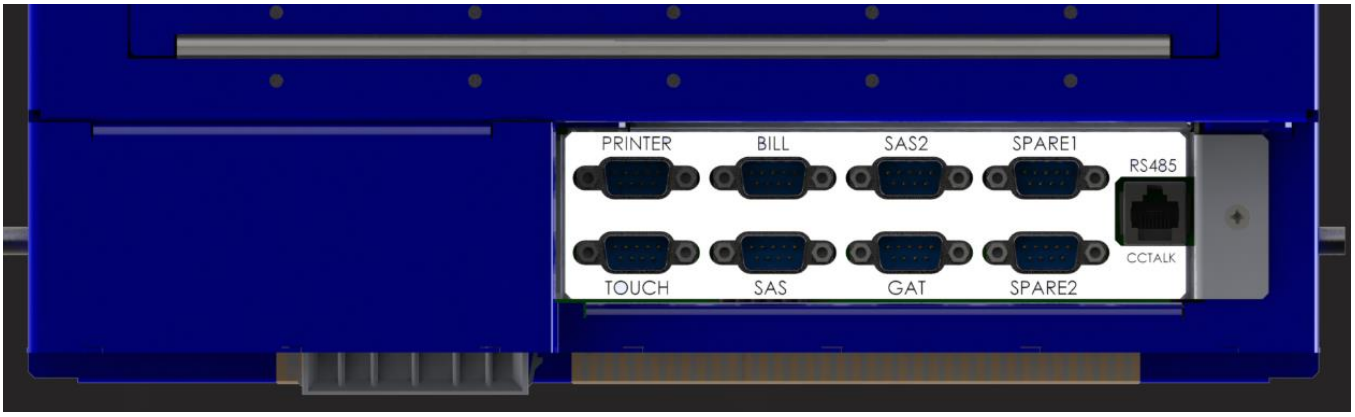
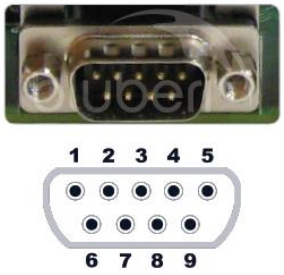


Figure 17: Back connections

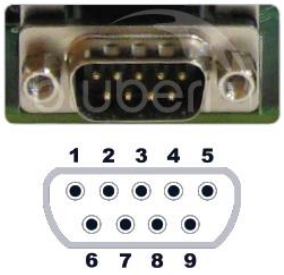
Printer DB-9 Connector

PIN	FUNCTION
1	NC
2	RXD
3	TXD
4	DTR
5	GND
6	DSR
7	RTS
8	CTS
9	RI



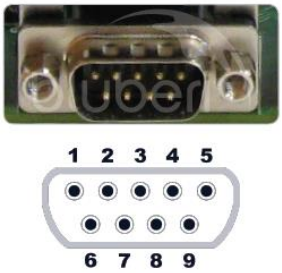
Touch DB-9 Connector

PIN	FUNCTION
1	NC
2	RXD
3	TXD
4	DTR
5	GND
6	DSR
7	RTS
8	CTS
9	RI



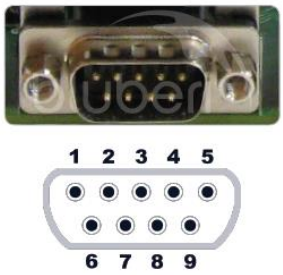
Bill DB-9 connector

PIN	FUNCTION
1	NC
2	RXD
3	TXD
4	NC
5	GND
6	NC
7	NC
8	NC
9	NC



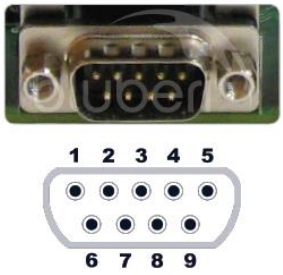
SAS DB-9 connector

PIN	FUNCTION
1	NC
2	RXD
3	TXD
4	NC
5	GND
6	NC
7	NC
8	NC
9	NC



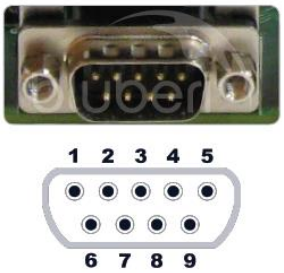
SAS2 DB-9 connector

PIN	FUNCTION
1	NC
2	RXD
3	TXD
4	NC
5	GND
6	NC
7	NC
8	NC
9	NC



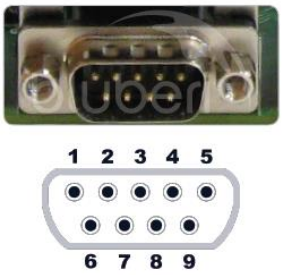
GAT DB-9 connector

PIN	FUNCTION
1	NC
2	RXD
3	TXD
4	NC
5	GND
6	NC
7	NC
8	NC
9	NC



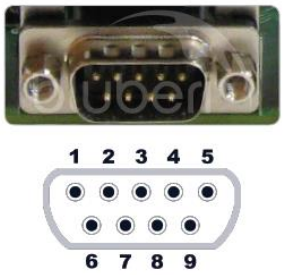
SPARE1 DB-9 connector

PIN	FUNCTION
1	NC
2	RXD
3	TXD
4	NC
5	GND
6	NC
7	NC
8	NC
9	NC



SPARE2 DB-9 connector

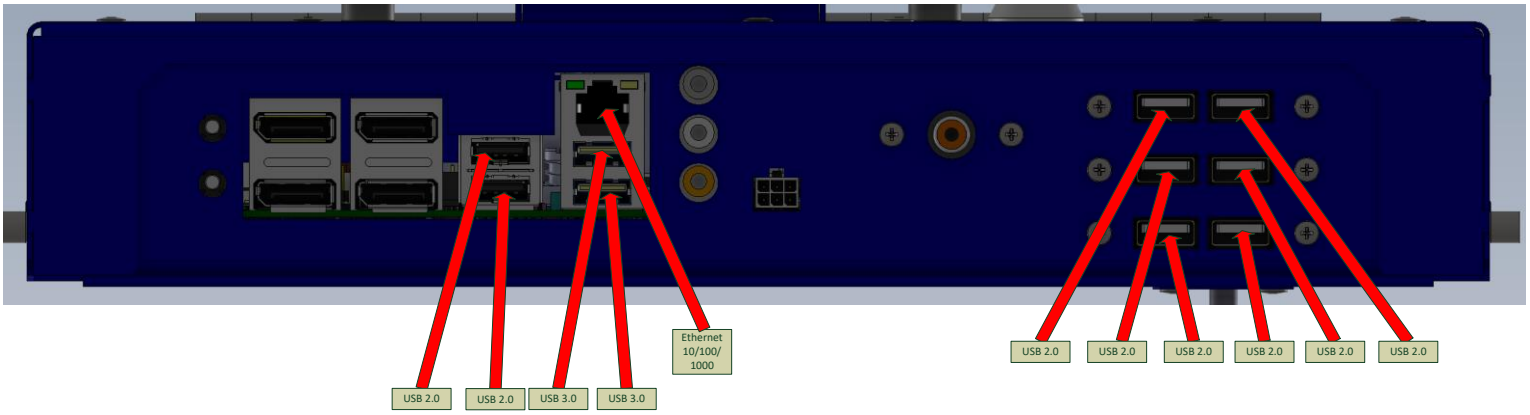
PIN	FUNCTION
1	NC
2	RXD
3	TXD
4	NC
5	GND
6	NC
7	NC
8	NC
9	NC



Spare485 + CCTALK RJ-45 Connector (RS485 + CCTALK)

PIN	FUNCTION
1	CCTALK RJ45
2	DOUT-
3	DOUT+
4	GND
5	GND
6	DIN+
7	DIN-
8	NC

Ethernet and USB



Ethernet RJ-45 Connector (10/100/1000 MBPS)

PIN	FUNCTION
1	TXRX A+
2	TXRX A-
3	TXRX B+
4	TXRX C+
5	TXRX C-
6	TXRX B-
7	TXRX D+
8	TXRX D-

USB2 Connector

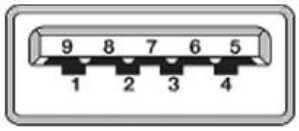
PIN	FUNCTION
1	+5VDC*
2	DAT-
3	DAT+
4	GND

*+5VDC current limited to 500mA for USB2

USB3 Connector

PIN	FUNCTION
1	+5VDC*
2	DAT-
3	DAT+
4	GND
5	STDA_SSRX-
6	STDA_SSRX+
7	GND DRAIN
8	STDA_SSTX-
9	STDA_SSTX+

*+5VDC power limited to 1.1A for USB3



Miscellaneous

DIP switch

An 8 position DIP switch is available on the Advantech board for software configuration.

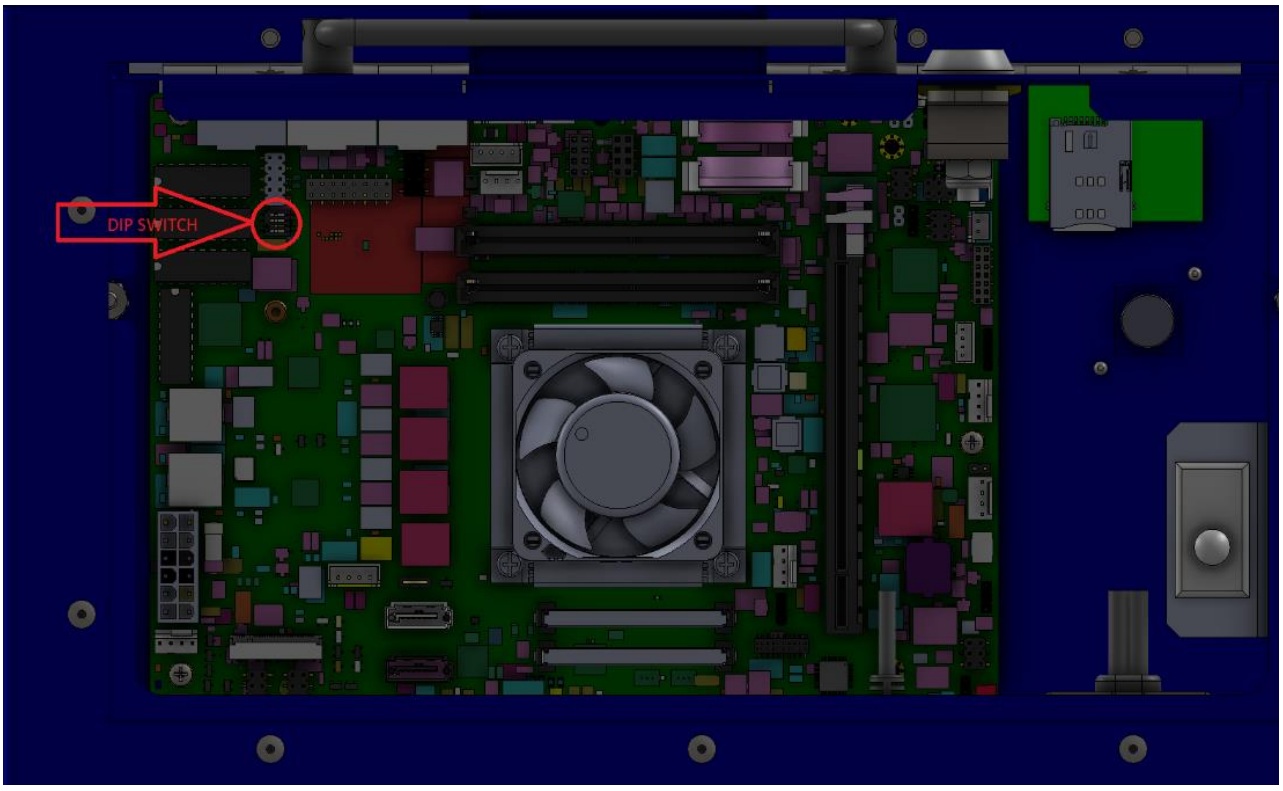


Figure 18: DIP switch

DIP switch functions

DIPSW#	POS	FUNCTION
DIP SWITCH #1	OFF	NORMAL START-UP (LOAD CFAST GAME)
	ON	REMAIN IN APPLICATION LOADER APP.
DIP SWITCH #2	OFF	IP ADDRESS REQUESTED FROM DHCP
	ON	DISABLE ETHERNET
DIP SWITCH #3	OFF	NORMAL RESET
	ON	HARDRESET
DIP SWITCH #4	OFF	DISABLE SERIAL TOUCHSCREEN SUPPORT
	ON	ENABLE SERIAL TOUCHSCREEN SUPPORT

Lock installation

Here is picture that explain how to install the lock:

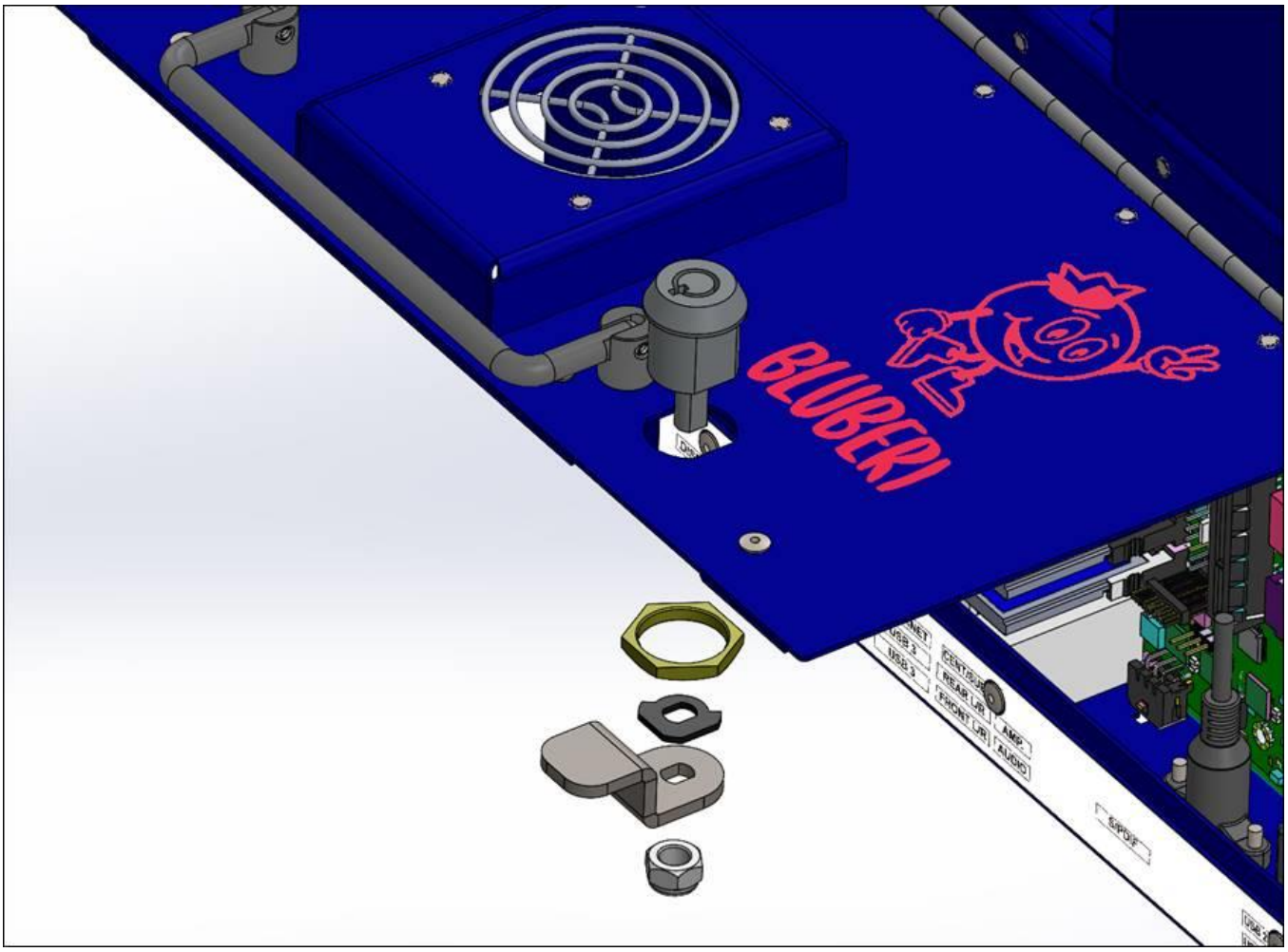


Figure 19: Lock installation

Contact Us

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

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