



User Guide

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Please check you local regulations for disposal of electronic devices

ACube Systems S.r.l.

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Welcome

Thanks for buying an ACube Systems motherboard!







Your Sam440ep board is ready to go. Just connect a hard drive, monitor, mouse and a keyboard, and switch it on! It could be housed into a mini-itx, flex-atx, micro-atx and full ATX computer case.

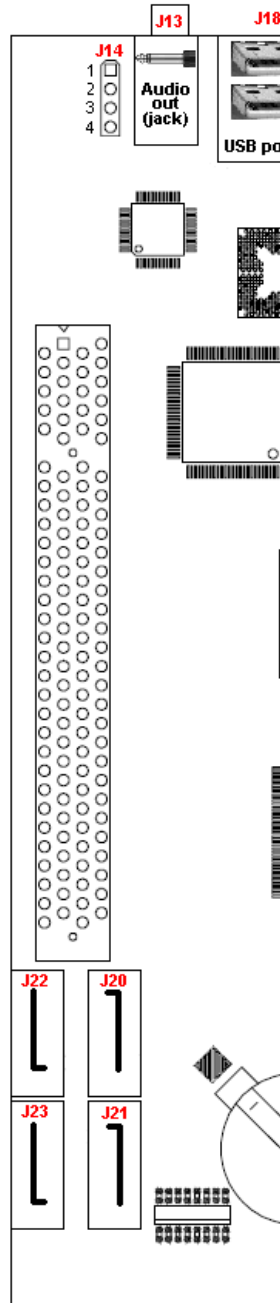
1. Package

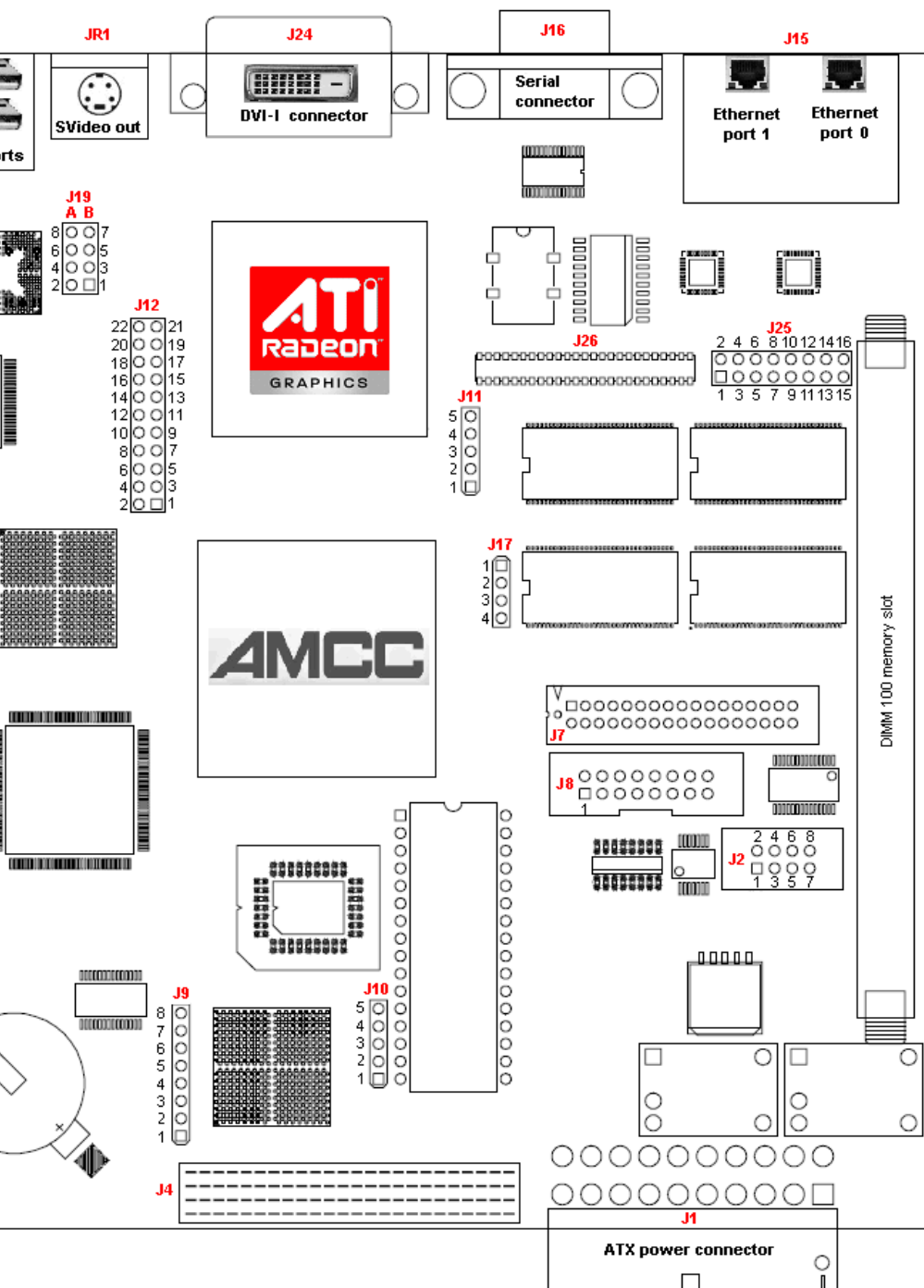
Check your motherboard packaging for the following items:

- Motherboard Sam440ep
- Memory 512 RAM module
- Cables 2 x SATA cables
- Accessories 1 x DVI to VGA converter
- Documentation User Guide

2. Features

| | |
|---|---|
| <ul style="list-style-type: none"> • PowerPC AMCC 440ep |  |
| <ul style="list-style-type: none"> • DDR Ram | |
| <ul style="list-style-type: none"> • ATI Radeon Mobility |  |
| <ul style="list-style-type: none"> • Serial ATA 1.5 Gb/s |  |
| <ul style="list-style-type: none"> • USB 2.0 |  |
| <ul style="list-style-type: none"> • Lattice XP FPGA |  |
| <ul style="list-style-type: none"> • Rohs compliance |  |





3. Sam440ep hardware specifications

- Mini-itx form factor (170 x 170 mm)
- 533/667 Mhz PowerPC AMCC 440ep Cpu
- 512 MB DDR Ram soldered onboard or as a DIMM module in a Slot
- ATI Radeon M9 64MB onchip (PCI 66 Mhz)
- Serial ATA Silicon Image 3114 controller - 4 ports (PCI 66 Mhz)
- Pericom 8150 PCI to PCI bridge
- Audio 5.1 onboard, CS 4281 and Realtek ALC655 codec (PCI 33 Mhz)
- Phillips ISP1561 USB EHCI/OHCI controller (PCI 33 Mhz)
- PCI expansion slot, 32 bits, 33 Mhz, 3.3V
- Dual 10/100 Ethernet controller
- LatticeXP FPGA with 80 I/O pins expansion connector
- RTC clock
- Serial port
- I2C and SPI/I2C buses

4. Rear panel connectors

J15 – Lan ports 0 and 1

J16 – Serial port

J24 – DVI port

JR1 – Svideo out

J18 – USB 2.0 ports 1 and 2

J13 – Audio out

5. Internal connectors

Case panel connector: J2

1-2 HD led

3-4 Power led

5-6 Power Switch

7-8 Reset Switch

USB

External USB ports: J18 (EHCI/OHCI)

Internal USB ports: J19 (EHCI/OHCI) and J17 (OHCI only)

J19a (port 3) 1 – VCC
3 – D-
5 – D+
7 – GND

J17 (port 5) 1 – VCC
2 – D-
3 – D+
4 – GND

J19b (port 4) 2 – VCC
4 – D-
6 – D+
8 – GND

Video

VGA 16 pin header: J25

| | |
|----------------|----------------|
| 1 – Red | 2 – Green |
| 3 – Blue | 4 – NC |
| 5 – GND | 6 – GND |
| 7 – GND | 8 – GND |
| 9 – 5V | 10 – GND |
| 11 – NC | 12 – VGA SDA |
| 13 – VGA HSYNC | 14 – VGA VSYNC |
| 15 – VGA SCL | 16 – NC |

DVI-I: J24

SVideo out: JR1

LVDS: J26

Audio

Audio out: J13 (jack stereo)

Audio in: J14 (DVD/CD)

Audio expansion port: J12

| | |
|-------------|----------------|
| 1 – 3.3 V | 2 – 5 V |
| 3 – SPDIFI | 4 – SPDIFO |
| 5 – MIC1 | 6 – LINE_IN_L |
| 7 – JD0 | 8 – JD2 |
| 9 – MIC2 | 10 – LINE_IN_R |
| 11 – SURR_L | 12 – PCIM_OUT |
| 13 – SURR_R | 14 – PCIM_IN |
| 15 – AUX_L | 16 – CEN_OUT |
| 17 – AUX_R | 18 – LFE_OUT |
| 19 – FMIC | 20 – VREFOUT |
| 21 – GND | 22 – GND |

SATA ports: J20 (Hard Disk), J23 (DVD/CD), J21, J22

Ethernet

Dual Ethernet ports: J15

Note that the connector which is closer to the end of the board is considered as unit 0. The other port is unit 1.

Misc

ATX Power connector: J1

Serial port: J16

Cpu JTAG: J8

LatticeXP FPGA JTAG: J9

LatticeXP FPGA expansion connector: J4 (80 I/O pins available)

I2C bus port: J10

- 1 – SCLK
- 2 – 3.3V
- 3 – SDATA
- 4 – GND
- 5 – NC

SPI/I2C bus port: J11

- 1 – I2C SCLK / SPI SCL
- 2 – 3.3V
- 3 – I2C SDATA / SPI SDA
- 4 – GND
- 5 – SPI SDO

GPIO: J7

6. Firmware

Note: the 1.3.1 Uboot version shipped with the board is under constant development. Currently there are a few limitations, which may be resolved in future updates.

To use an USB keyboard under UBoot, it needs to be attached to the upper external USB port (J18) or internal header J19A.

Uboot currently handles only 2 SATA ports from which you can boot. It means that you must connect devices you want to boot from on J20 and J23 only.

Obviously, other devices will be recognised when the operating system is loaded.

7. Video output

Maximum screen resolutions are:

- 1600x1200 in DVI
- 2048x1536 in VGA

Included with the board there is a DVI -> VGA adapter, to be connected to J24.

Currently there are two ways to use an analog monitor: connect a CRT / LCD monitor to the DVI-I connector via the provided DVI -> VGA adapter, or use a CRT / LCD monitor on the onboard VGA header (J25) via a VGA cable.

Note that we recommend to use directly the DVI-I digital output to have the better image quality.

Also note that using a DVI -> VGA adapter, the operating system will not be able to retrieve the usable resolutions from your monitor (using DDC method). So in this case, you'll have to manually enter the min/ max frequencies and resolutions your monitor handles.

8. Instructions

There is a blue led near the J21 Sata connector. When this led is lit, the board is under power. When the board is switched on, this led should go off and the power led on the computer case should light on.

9. Safety Information

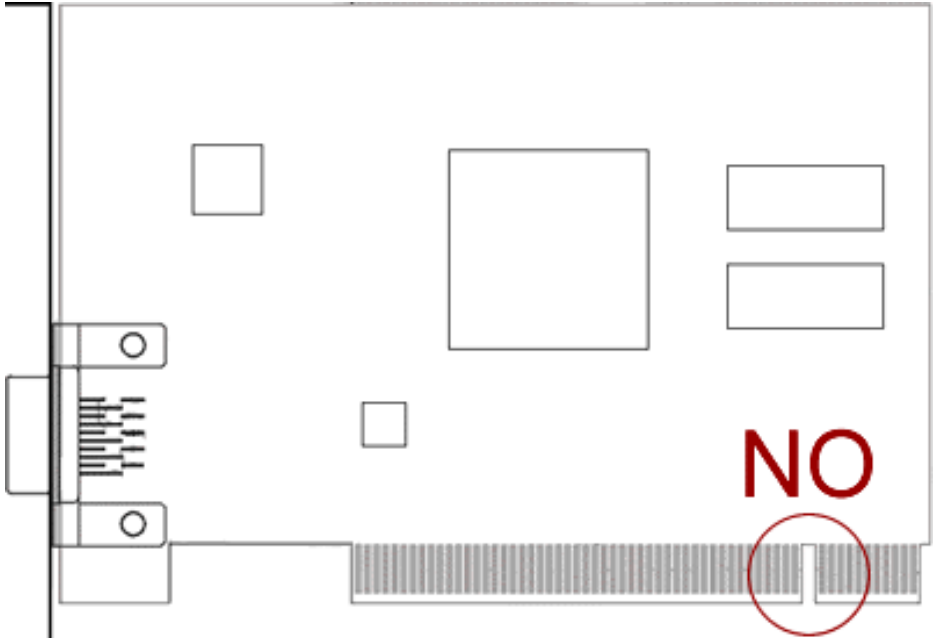
ALWAYS DISCONNECT ALL POWER CABLES BEFORE CONNECTING OR REMOVING CABLES FROM THE MOTHERBOARD.

Also make sure that your power supply is set to correct voltage in your area.

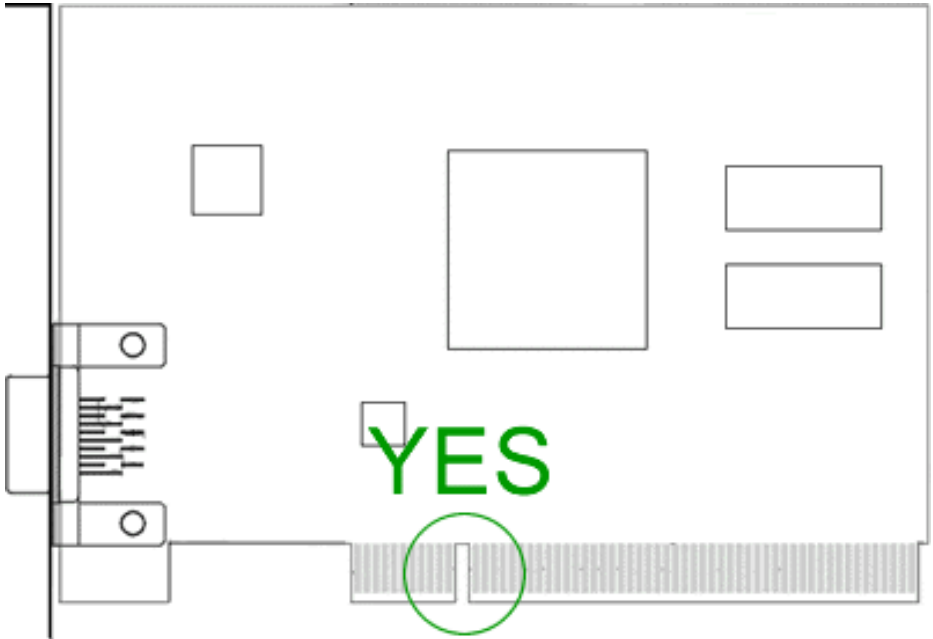
10. PCI SLOT

Warning: the PCI slot is compatible with 3.3V PCI cards only. Inserting a 5.0V PCI card will damage the Sam440ep board!!

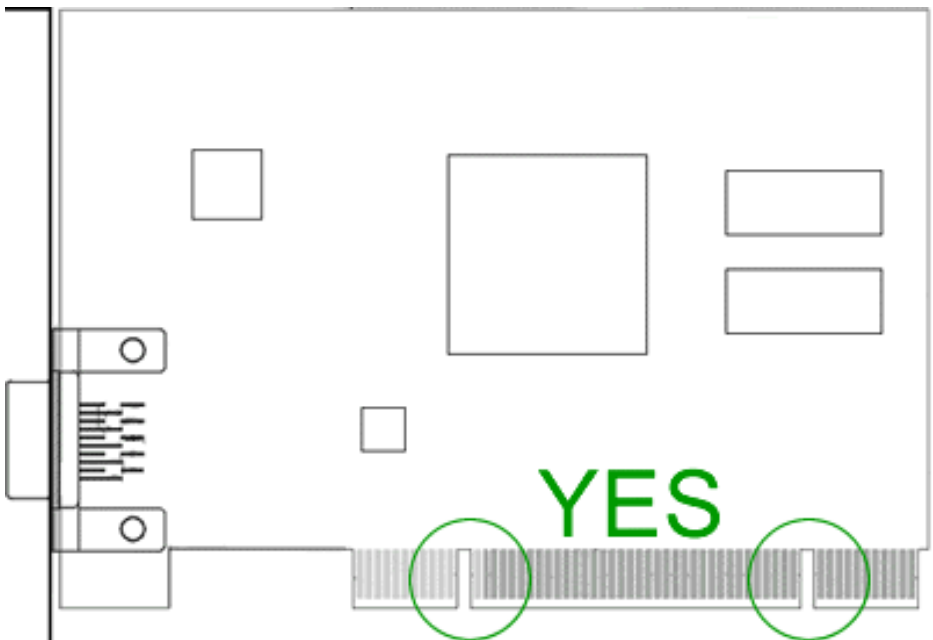
Do not try to reverse a 5.0V PCI board to fit it into the 3.3V PCI slot, it will damage your board!!



5V compatible PCI card – DO NOT use it



3,3V compatible PCI card – OK



3,3V and 5V compatible PCI card – OK

