PC Engines

ALIX.1C/1D system board
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www.pcengines.ch

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Federal Communications Commission Statement

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

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 in a residential installation. This equipment generates, uses and can radiate radio energy. If this equipment is not installed and used in accordance with the manufacturer’s instructions, it may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment to an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

This board is designed for installation in a shielded enclosure (metal or plastic with conductive coating). Shielded cables are required on LAN and serial ports to assure compliance with FCC regulations.

A copy of the test report will be provided on request.

CE Declaration of Conformity

We, PC Engines GmbH, declare that ALIX1.C, when installed in the mini-box M200 metal enclosure, is in conformance with:

- EN 61000-6-3 (2005) (emissions, residential and industrial)
- EN 61000-6-2 (ESD, susceptibility, residential and industrial)

The unit under test is in conformity with the standards mentioned above.

A copy of the test report will be provided on request.

Compliance information

For FCC, ALIX has been tested as a CPU board, installed in an enclosure, with the top cover removed. No further testing should be required if the board is used with other FCC tested modular components. Please see http://www.fcc.gov/oet/ for more details. The responsible party for FCC is the importer.

Testing for CE mark must be done at the level of the complete product, possibly including the wireless cards. Please contact PC Engines for assistance and documentation.
For satisfactory resistance to electrostatic discharge events (ESD), the ALIX board should be grounded (e.g. through the mounting holes, or the serial port connector).

**Recycling / disposal**

Do not discard electronic products in household trash! All waste electronics equipment should be recycled properly. Actual procedures depend on your country.

**Information for the recycler:**

Please remove lithium battery from the socket for separate recycling.
**Introduction / features**

ALIX is a miniITX form factor system board optimized for thin clients and embedded applications.

- AMD Geode LX CPU, 500 MHz (LX800) 5x86 CPU,
- 256 KB cache (64K data + 64K instruction + 128K L2)
- 1 Ethernet channel (Via VT6105M)
- 1 miniPCI + 1 PCI socket (3.3V) for 802.11 wireless cards and other expansion
- 256 MB DDR SDRAM, 64 bit wide for high memory bandwidth
- 512 KB flash for Award system BIOS.
- CompactFlash + 44 pin IDE header for user's operating system and application
- 12V DC supply through DC jack
- 2 serial port (DB9 male + 10 pin header)
- 1 parallel port (26 pin header)
- Combined PS/2 keyboard + mouse port
- VGA port
- 4 USB 2.0 ports (2 on rear panel connector + 2 on 10 pin header)
- AC97 audio codec (line in / line out on board, headphone + mic on 10 pin header)
- Header for LPC bus (use for flash recovery or I/O expansion)
- GPIO header for user expansion
- Optional header for TFT LCD interface, I2C bus
- Front panel header for power switch, reset, hard disk and power LED
- Buzzer for “beeps”
- Socketed RTC battery

**Technical data**

Power supply  
+12V DC, ~ 0.007A off state, typical about 0.4A active  
Peak power can be higher, suggest a 15W supply.  
Center pin = positive, sleeve = ground, 2.5 mm diameter.

Temperature range  
0 to 50°C.

Dimensions  
ALIX.1C = 6.7 x 6.7” (170 x 170 mm)
OEM options

The following options can be configured for larger orders:

- DRAM size (128 MB, 256 MB)
- CPU speed (LX700 / LX800 / LX900)
- Delete I/O not required by customer
- CMOS level serial port (RXD / TXD only)
- Power LED
- PC Engines tinyBIOS (no support for VGA / USB boot etc)
Getting started…

- Connect a 12V DC power supply to the DC jack J2. 2.5 mm center pin = positive, sleeve = ground. Power supply should be able to supply at least 12W for some margin. To avoid arcing, please plug in the DC jack first, then plug the adapter into mains.

- Connect VGA, keyboard and mouse as needed. To connect a PS/2 mouse, use an off-the-shelf PS/2 keyboard / mouse splitter such as PC Engines ps2split. Some splitters may cause the BIOS to hang, test without or swap keyboard and mouse connections if this happens.

- Insert a bootable CF card. Hot swap of CF cards is not supported!

- Power on. If a jumper is installed on the SWI pins of front panel header J26, the board will start up immediately. Connect a pushbutton switch to these pins for manual control and software controlled power off.

You should see BIOS startup messages etc.

Setup options

ALIX uses Award BIOS for more features and operating system compatibility. Press Delete during startup to enter setup.

Press Escape to get a boot menu. (BIOS 8/21/07 and later).

Hardware compatibility

The PCI slot supports 3.3V cards and riser cards ONLY. Do not attempt to insert a 5V adapter or riser card “the wrong way” – you may damage ALIX or your adapter card.

12V and –12V are not connected to the PCI slot, as the input voltage may not always be exactly 12V. There is no 3.3V aux supply.

If using header J15 to feed power into the board, use the 12V and GND pins only, do NOT feed 5V into the board.

Commell MP-541D miniPCI dual Ethernet card will not work. This card uses another ID select line for the second Ethernet channel, which the BIOS does not know about, and violates the PCI specification.

Cologne HFC-S ISDN does not work on Geode LX.

Sandisk Extreme III CF cards don’t work as master, try to change jumper J28 to run it as slave.

To reduce standby power draw, Ethernet Wake on LAN is not supported.
Software issues

Linux boot may hang if no monitor is attached. According to customer reports this issue can be avoided by grounding pin 12 (DDCDAT) of the VGA connector. This seems to be caused by a BIOS issue.

Incorrect use of the CS5536 MFGPT (multi function timer) can hang the board. If in doubt, please disable this option in your kernel.

IDE CD-ROM or DVD

While not intended for normal operation, this can be useful to install operating systems etc. I use an AT (not ATX) power supply. Create a special cable to go from 12V and GND to the DC jack (snip up a drive power Y or extension cable). Connect the optical drive using a 44 pin to 40 pin IDE cable, jumper as slave device. This works best with the jumper installed across the SWI pins of the front panel header J26 (see above).

USD CD-ROM or DVD

Booting from USB CD-ROM / DVD is another option. The BIOS may be a bit too quick for these devices. Press Pause during startup, then Escape to enter the boot menu.

BIOS upgrade

The current BIOS can always be found at www.pcengines.ch/alix1d.htm.

To upgrade, boot from a CF card to FreeDOS (see www.pcengines.ch/freedos.htm), then execute the flash upgrader (sb.com).

Do not turn off power while the flash upgrade is running, otherwise the flash BIOS may be corrupted. If this happens, the board can be revived using an LPC adapter available from PC Engines.

POST codes

The system BIOS writes POST / diagnostic codes to port 80h. To make these codes visible, use a miniPCI POST card such as PC Engines POST.5A. A POST code table can be found at:


Support

Please email support@pcengines.ch.
Damn Small Linux – Not (DSL-N)
Tested ok booting from CD (version RC4). Installation to CF card was not successful.

Debian Linux (Etch)
Works ok.
Boot may hang when no monitor is present (see software issues, above).

FreeBSD
Beta test: 6.1 working if USB 2.0 is disabled in the BIOS setup. Kernel panic otherwise.
USB 2.0 requires a patch for correct recognition of the CS5536 USB controller.
An audio driver can be found at http://modelofreality.org/snd_amd5536.html.

iMedia Linux
(see www.imedialinux.com)
Installation from CD (version 5.0.1, 5.0.2) to CF card works fine. Recommend Fluxbox window manager. Fits on a 512 MB CF card with room to spare. Includes native drivers for the Geode LX CPU.

FreeDOS, MS-DOS 5.0
Tested ok, booting from CF card.

NetBSD
Not yet tested.

OpenBSD
For X11 and audio support, please use OpenBSD 4.3-current or later versions.

Ubuntu Linux
Recommend using “light” versions such as Xubuntu (XFCE window manager).
Note https://bugs.launchpad.net/ubuntu/+bug/156042 about setting the AMD video driver, and
Fluxbuntu looks interesting, but the current 7.10RC seems broken.
Windows XP Home

Installation from CD to a 2 GB CF card worked ok.

Drivers can be downloaded from the PC Engines web site.

Via network driver ->

ALIX connector pinouts

From left to right, rear to front. Full board schematics are available online!

**J2 DC power jack**

This is a generic DC jack connector with a 2.5mm center pin. Recommended input voltage is +12V. Supply current is about 0.4A at 12V, without any miniPCI adapters or USB devices installed. Absolute maximum rating for the FAN5026 switching regulator is 16V, be careful when connecting to unregulated sources such as solar regulators etc.

<table>
<thead>
<tr>
<th>Pin</th>
<th>Description</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>center</td>
<td>VIN</td>
<td>Positive input voltage</td>
</tr>
<tr>
<td>sleeve</td>
<td>GND</td>
<td>Ground</td>
</tr>
</tbody>
</table>

**J15 DC power header**

This is a 0.156” pitch header for feeding or tapping power.

<table>
<thead>
<tr>
<th>Pin</th>
<th>Description</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>VIN</td>
<td>+12V in or out (not switched)</td>
</tr>
<tr>
<td>2</td>
<td>GND</td>
<td>Ground</td>
</tr>
<tr>
<td>3</td>
<td>GND</td>
<td>Ground</td>
</tr>
<tr>
<td>4</td>
<td>VCC</td>
<td>+5V supply (output only, DO NOT feed power into this pin !)</td>
</tr>
</tbody>
</table>

**J5 PS/2 keyboard / mouse**

Keyboard and mouse are combined on one connector to save backpanel space and avoid a tall stacked connector. Use an off-the-shelf splitter if both keyboard and mouse are needed. Please note that not all splitters use the same pinout... If the BIOS does not come up, try to swap keyboard and mouse.

<table>
<thead>
<tr>
<th>Pin</th>
<th>Description</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>KBDAT</td>
<td>keyboard data</td>
</tr>
<tr>
<td>2</td>
<td>MSDAT</td>
<td>mouse data</td>
</tr>
<tr>
<td>3</td>
<td>GND</td>
<td>ground</td>
</tr>
<tr>
<td>4</td>
<td>VCC</td>
<td>+5V supply</td>
</tr>
<tr>
<td>5</td>
<td>KBCLK</td>
<td>keyboard clock</td>
</tr>
<tr>
<td>6</td>
<td>MSCLK</td>
<td>mouse clock</td>
</tr>
</tbody>
</table>

**J6 VGA**

<table>
<thead>
<tr>
<th>Pin</th>
<th>Description</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>VGAR</td>
<td>VGA red</td>
</tr>
<tr>
<td>2</td>
<td>VGAG</td>
<td>VGA green</td>
</tr>
<tr>
<td>3</td>
<td>VGAB</td>
<td>VGA blue</td>
</tr>
<tr>
<td>4</td>
<td>nc</td>
<td>no connect</td>
</tr>
<tr>
<td>5</td>
<td>GND</td>
<td>ground</td>
</tr>
<tr>
<td>6</td>
<td>GND</td>
<td>ground</td>
</tr>
<tr>
<td>7</td>
<td>GND</td>
<td>ground</td>
</tr>
<tr>
<td>8</td>
<td>GND</td>
<td>ground</td>
</tr>
<tr>
<td>9</td>
<td>KBVCC</td>
<td>+5V supply</td>
</tr>
<tr>
<td>10</td>
<td>GND</td>
<td>ground</td>
</tr>
<tr>
<td>11</td>
<td>nc</td>
<td>no connect</td>
</tr>
<tr>
<td>12</td>
<td>DDCDAT</td>
<td>DDC data</td>
</tr>
<tr>
<td>13</td>
<td>HS</td>
<td>horizontal sync</td>
</tr>
<tr>
<td>14</td>
<td>VS</td>
<td>vertical sync</td>
</tr>
<tr>
<td>15</td>
<td>DDCCLK</td>
<td>DDC clock</td>
</tr>
</tbody>
</table>
J7  COM1 serial port

The standard PC pinout is used. To connect to a PC, use a null modem or “Laplink” cable.

1. DCD  data carrier detect (input)
2. RXD# receive data (input)
3. TXD# transmit data (output)
4. DTR  data terminal ready (output)
5. GND  ground
6. DSR  data set ready (input)
7. RTS  ready to send (output)
8. CTS  clear to send (input)
9. RI   ring indicator (input)

J9  COM2 serial port

10 pin header. (DB9 pin numbers in parentheses). Use an off-the-shelf 10 pin to DB9 cable. Please note that there are two different configurations for these cables… Intel configuration will not work.

1 (1) DCD  data carrier detect (input)
3 (2) RXD# receive data (input)
5 (3) TXD# transmit data (output)
7 (4) DTR  data terminal ready (output)
9 (5) GND  ground
2 (6) DSR  data set ready (input)
4 (7) RTS  ready to send (output)
6 (8) CTS  clear to send (input)
8 (9) RI   ring indicator (input)
10  nc    no connect

J8  USB jack

Dual USB 2.0 connections:

1. VCC switched +5V supply
2. DATA4- negative data
3. DATA4+ positive data
4. GND  ground
5. VCC switched +5V supply
6. DATA3- negative data
7. DATA3+ positive data
8. GND  ground

J12 USB header

Dual USB 2.0 connections:

1. VCC switched +5V supply
2. VCC “
3. DATA1- negative data
4. DATA2- negative data
5. DATA1+ positive data
6. DATA2+ positive data
7. GND  ground
8. GND  ground
9. key  key pin (missing)
J1  Ethernet port 1
A RJ45 connector with integrated magnetics is used. ALIX does not support power over Ethernet.

1  TX+  transmit positive
2  TX-  transmit negative
3  RX+  receive positive
4  -  unused pair, 75 ohm terminated
5  -  unused pair, 75 ohm terminated
6  RX-  receive negative
7  -  unused pair, 75 ohm terminated
8  -  unused pair, 75 ohm terminated

J3  Audio line in

J4  Audio line out

J30  Headphone out (connector on piggy-back board)

J29  Microphone in (connector on piggy-back board)

J10  Audio expansion (normally used for piggy-back board)

Additional audio signals can be accessed on this header.

1  MIC1  microphone, with phantom power
2  AUGND  ground
3  AUVCC  audio supply for microphone through 10K resistor
4  AUVCC  audio supply
5  HP_R  headphone right
6  nc  no connect
7  nc  no connect
8  key  key pin (missing)
9  HP_L  headphone left
10  nc  no connect

J13  SPDIF in
Optional, not tested.

1  SPDIF  SP/DIF digital input
2  GND  ground

J16  LPC expansion
The LPC port can be used to connect an additional super I/O device, or for an alternate flash EPROM to start the board when on board flash is corrupted or blank. Unlike earlier SC1100 based WRAP boards, this port cannot be used as GPIO pins. The on-board super I/O is configured at I/O address 2Eh, please select a different configuration address for expansion devices.

1  LCLK0  LPC clock (33 MHz)
2  GND  ground
3  LAD0  LPC data 0
4  GND  ground
5  LAD1  LPC data 1
6  GND  ground
<table>
<thead>
<tr>
<th>Pin</th>
<th>Description</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>LAD2</td>
<td>LPC data 2</td>
</tr>
<tr>
<td>8</td>
<td>GND</td>
<td>ground</td>
</tr>
<tr>
<td>9</td>
<td>LAD3</td>
<td>LPC data 3</td>
</tr>
<tr>
<td>10</td>
<td>GND</td>
<td>ground</td>
</tr>
<tr>
<td>11</td>
<td>LFRAME#</td>
<td>LPC frame</td>
</tr>
<tr>
<td>12</td>
<td>GND</td>
<td>ground</td>
</tr>
<tr>
<td>13</td>
<td>PCIRST#</td>
<td>reset (active low)</td>
</tr>
<tr>
<td>14</td>
<td>NC</td>
<td>reserved</td>
</tr>
<tr>
<td>15</td>
<td>ISP</td>
<td>high to use LPC flash, low to use on-board flash, pulled low by resistor</td>
</tr>
<tr>
<td>16</td>
<td>VCC</td>
<td>+5V supply</td>
</tr>
<tr>
<td>17</td>
<td>GND</td>
<td>ground</td>
</tr>
<tr>
<td>18</td>
<td>V3</td>
<td>+3.3V supply</td>
</tr>
<tr>
<td>19</td>
<td>SERIRQ</td>
<td>serial interrupt</td>
</tr>
<tr>
<td>20</td>
<td>LDRQ#</td>
<td>LPC DMA request</td>
</tr>
</tbody>
</table>

**J14 LPT1 parallel port**

26 pin header. (DB9 pin numbers in parantheses). Use an off-the-shelf 26 pin to DB25 cable. Please note that there are two different configurations for these cables. Intel configuration will not work.

<table>
<thead>
<tr>
<th>Pin</th>
<th>Description</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>(1) PSTB#</td>
<td>printer strobe</td>
</tr>
<tr>
<td>3</td>
<td>(2) PP0</td>
<td>printer data 0</td>
</tr>
<tr>
<td>5</td>
<td>(3) PP1</td>
<td>printer data 1</td>
</tr>
<tr>
<td>7</td>
<td>(4) PP2</td>
<td>printer data 2</td>
</tr>
<tr>
<td>9</td>
<td>(5) PP3</td>
<td>printer data 3</td>
</tr>
<tr>
<td>11</td>
<td>(6) PP4</td>
<td>printer data 4</td>
</tr>
<tr>
<td>13</td>
<td>(7) PP5</td>
<td>printer data 5</td>
</tr>
<tr>
<td>15</td>
<td>(8) PP6</td>
<td>printer data 6</td>
</tr>
<tr>
<td>17</td>
<td>(9) PP7</td>
<td>printer data 7</td>
</tr>
<tr>
<td>19</td>
<td>(10) ACK#</td>
<td>printer acknowledge</td>
</tr>
<tr>
<td>21</td>
<td>(11) BUSY</td>
<td>printer busy</td>
</tr>
<tr>
<td>23</td>
<td>(12) PE</td>
<td>printer paper end</td>
</tr>
<tr>
<td>25</td>
<td>(13) SLCT</td>
<td>printer select</td>
</tr>
<tr>
<td>2</td>
<td>(14) AFD#</td>
<td>printer auto feed</td>
</tr>
<tr>
<td>4</td>
<td>(15) ERR#</td>
<td>printer error</td>
</tr>
<tr>
<td>6</td>
<td>(16) INIT#</td>
<td>printer init</td>
</tr>
<tr>
<td>8</td>
<td>(17) SCI#</td>
<td>printer select in</td>
</tr>
<tr>
<td>10</td>
<td>(18) GND</td>
<td>ground</td>
</tr>
<tr>
<td>12</td>
<td>(19) GND</td>
<td>ground</td>
</tr>
<tr>
<td>14</td>
<td>(20) GND</td>
<td>ground</td>
</tr>
<tr>
<td>16</td>
<td>(21) GND</td>
<td>ground</td>
</tr>
<tr>
<td>18</td>
<td>(22) GND</td>
<td>ground</td>
</tr>
<tr>
<td>20</td>
<td>(23) GND</td>
<td>ground</td>
</tr>
<tr>
<td>22</td>
<td>(24) GND</td>
<td>ground</td>
</tr>
<tr>
<td>24</td>
<td>(25) GND</td>
<td>ground</td>
</tr>
<tr>
<td>26</td>
<td>nc</td>
<td>no connect</td>
</tr>
</tbody>
</table>
### J11 GPIO expansion

These pins are connected to the GPIO pins of the Winbond W83627HF super I/O controller. Please refer to the Winbond data sheet for programming instructions.

1. VCC  +5V supply  
2. GND  ground  
3. WIO10  GP10  (also connected to LCD header)  
4. WIO11  GP11  
5. WIO12  GP12  
6. WIO13  GP13  
7. WIO14  GP14  
8. WIO15  GP15  
9. WIO16  GP16  
10. WIO17  GP17  
11. WIMSO  MSO/IRQIN0  
12. WIO20  GP20  
13. WIO21  GP21  
14. WIO22  GP22  
15. WIO23  GP23  
16. WIO24  GP24  
17. WIO25  GP25  (pulled up)  
18. WIO26  GP26  
19. WIO30  GP30  (pulled up)  
20. WIO31  GP31  
21. WIO32  GP32  (pulled up)  
22. WIO33  GP33  
23. WIO34  GP34  (pulled up)  
24. WIO35  GP35  
25. VCC  +5V supply  
26. GND  ground  

**BAT1 RTC battery**

Socketed CR2032 Lithium battery.

**J22 RTC clear jumper**

1-2  normal operation  
2-3  clear RTC  

**J17 miniPCI socket**

This socket implements the miniPCI interface. Please see schematics for pinout.

**J18 PCI socket**

This socket implements the 3.3V PCI interface. Please see schematics for pinout.

-12V and +12V supplies are not connected. 3.3V aux is not connected.
J19  TFT LCD

This header can be used to interface a TFT LCD panel. CMOS to LVDS conversion will be required for most panels. Not tested, will be installed by request only.

1  LCVCC  +5V power, controlled by LCDEN
2  LCVCC  “
3  V3     +3.3V power
4  V3     “
5  GND    ground
6  GND    ground
7  LCB7   blue bit 7
8  LCB6   blue bit 6
9  LCB5   blue bit 5
10 LCB4   blue bit 4
11 GND    ground
12 LCB3   blue bit 3
13 LCB2   blue bit 2
14 LCB1   blue bit 1
15 LCB0   blue bit 0
16 GND    ground
17 LCG7   green bit 7
18 LCG6   green bit 6
19 LCG5   green bit 5
20 LCG4   green bit 4
21 GND    ground
22 LCG3   green bit 3
23 LCG2   green bit 2
24 LCG1   green bit 1
25 LCG0   green bit 0
26 GND    ground
27 LCR7   red bit 7
28 LCR6   red bit 6
29 LCR5   red bit 5
30 LCR4   red bit 4
31 GND    ground
32 LCR3   red bit 3
33 LCR2   red bit 2
34 LCR1   red bit 1
35 LCR0   red bit 0
36 HSYNC  horizontal sync
37 LCDEN  LCD power enable
38 LCCLK  LCD pixel clock
39 LCDDE  LCD data enable
40 GND    ground
41 VSYNC  vertical sync
42 PWM    CS5536 GPIO27 / MFGPT7 timer output
43 LCDIO1 W83627HF GP10
44 DISPEN LCD display enable
### J25  I2C header

This optional header can be used to connect user specific hardware, e.g. a front panel microcontroller, or for a licensing dongle.

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>+3.3V power supply</td>
</tr>
<tr>
<td>2</td>
<td>SMB_SCL I2C clock</td>
</tr>
<tr>
<td>3</td>
<td>SMB_SDA I2C data</td>
</tr>
<tr>
<td>4</td>
<td>GND ground</td>
</tr>
</tbody>
</table>

### J21  IDE header

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>HDRST# IDE reset</td>
</tr>
<tr>
<td>2</td>
<td>GND ground</td>
</tr>
<tr>
<td>3</td>
<td>HDD7 IDE data 7</td>
</tr>
<tr>
<td>4</td>
<td>HDD8 IDE data 8</td>
</tr>
<tr>
<td>5</td>
<td>HDD6 IDE data 6</td>
</tr>
<tr>
<td>6</td>
<td>HDD9 IDE data 9</td>
</tr>
<tr>
<td>7</td>
<td>HDD5 IDE data 5</td>
</tr>
<tr>
<td>8</td>
<td>HDD10 IDE data 10</td>
</tr>
<tr>
<td>9</td>
<td>HDD4 IDE data 4</td>
</tr>
<tr>
<td>10</td>
<td>HDD11 IDE data 11</td>
</tr>
<tr>
<td>11</td>
<td>HDD3 IDE data 3</td>
</tr>
<tr>
<td>12</td>
<td>HDD12 IDE data 12</td>
</tr>
<tr>
<td>13</td>
<td>HDD2 IDE data 2</td>
</tr>
<tr>
<td>14</td>
<td>HDD13 IDE data 13</td>
</tr>
<tr>
<td>15</td>
<td>HDD1 IDE data 1</td>
</tr>
<tr>
<td>16</td>
<td>HDD14 IDE data 14</td>
</tr>
<tr>
<td>17</td>
<td>HDD0 IDE data 0</td>
</tr>
<tr>
<td>18</td>
<td>HDD15 IDE data 15</td>
</tr>
<tr>
<td>19</td>
<td>GND ground</td>
</tr>
<tr>
<td>20</td>
<td>key key pin (missing)</td>
</tr>
<tr>
<td>21</td>
<td>HDRQ IDE DMA request</td>
</tr>
<tr>
<td>22</td>
<td>GND ground</td>
</tr>
<tr>
<td>23</td>
<td>HDIOW# IDE I/O write</td>
</tr>
<tr>
<td>24</td>
<td>GND ground</td>
</tr>
<tr>
<td>25</td>
<td>HDIOR# IDE I/O read</td>
</tr>
<tr>
<td>26</td>
<td>GND ground</td>
</tr>
<tr>
<td>27</td>
<td>HDIORDY IDE I/O ready</td>
</tr>
<tr>
<td>28</td>
<td>CSEL cable select (pull down)</td>
</tr>
<tr>
<td>29</td>
<td>HDACK# IDE DMA acknowledge</td>
</tr>
<tr>
<td>30</td>
<td>GND ground</td>
</tr>
<tr>
<td>31</td>
<td>HDIRQ IDE interrupt</td>
</tr>
<tr>
<td>32</td>
<td>nc no connect</td>
</tr>
<tr>
<td>33</td>
<td>HDA1 IDE address 1</td>
</tr>
<tr>
<td>34</td>
<td>HDPDIA# IDE diagnostic, 80 pin cable ID</td>
</tr>
<tr>
<td>35</td>
<td>HDA0 IDE address 0</td>
</tr>
<tr>
<td>36</td>
<td>HDA2 IDE address 2</td>
</tr>
<tr>
<td>37</td>
<td>HDCS0# IDE chip select 0</td>
</tr>
<tr>
<td>38</td>
<td>HDCS1# IDE chip select 1</td>
</tr>
<tr>
<td>39</td>
<td>HDLED# IDE led output</td>
</tr>
<tr>
<td>40</td>
<td>GND ground</td>
</tr>
</tbody>
</table>
41 VCC 5V power
42 VCC 5V power
43 GND ground
44 GND ground

J28 CompactFlash master / slave jumper
1-2 Install this jumper to make the CF card master (HDD should be jumpered as slave). Remove for slave.
3-4 Enables UltraATA mode for IDE and CF. Use at your own risk, keep IDE cable short.

J23 CompactFlash
The CompactFlash card is used in True IDE mode. Hot insertion is not supported – please power off the unit before inserting a CF card.

1 GND ground
2 D3 IDE data
3 D4 IDE data
4 D5 IDE data
5 D6 IDE data
6 D7 IDE data
7 CS0# IDE decode (1F0..1F7)
8 A10 ground
9 ATASEL# ground to select true IDE mode
10 A9 ground
11 A8 ground
12 A7 ground
13 VCC +3.3V power supply
14 A6 ground
15 A5 ground
16 A4 ground
17 A3 ground
18 A2 IDE address
19 A1 IDE address
20 A0 IDE address
21 D0 IDE data
22 D1 IDE data
23 D2 IDE data
24 IO16# 16 bit decode, not connected
25 CD2# card detect, not connected
26 CD1# card detect. not connected
27 D11 IDE data
28 D12 IDE data
29 D13 IDE data
30 D14 IDE data
31 D15 IDE data
32 CS1# IDE decode (3F6..3F7)
33 VS1# not connected
34 IOR# IDE read strobe
35 IOW# IDE write strobe
36 WE# connected to +3.3V
37  IRQ      IDE interrupt
38  VCC      +3.3V power supply
39  CSEL#    cable select, ground = master
40  VS2#     not connected
41  RESET#   IDE reset, active low
42  IORDY    IDE ready
43  INPACK#  IDE DMA request
44  REG#     IDE DMA acknowledge
45  DASP#    pulled up
46  PDIA#    pulled up
47  D8       IDE data
48  D9       IDE data
49  D10      IDE data
50  GND      ground

The CompactFlash specification can be found at www.compactflash.org.

**J26  Front panel header**

1  HDLED+   HDD LED, anode
2  PWRLED+  power LED, anode
3  HDLED-   HDD LED, cathode
4  PWRLED-  power LED, cathode
5  RESET#   system reset
6  PWRSW#   power switch
7  GND      ground
8  GND      ground
9  nc       no connect
10 key      key pin (missing)