

Commell P4LA support

29.11.2007 Not long ago, I learned about this motherboard, which was the only one that had an ISA slot and at the same time supported the new Intel Core 2 Duo processors - an ideal combination for me. In the end, I couldn't resist the temptation and decided to buy the mainboard and try it out. But that was a bit of a hassle. Such exoticism is out of the question in our banana country. Even in Europe I came across one single distributor with a not very attractive price of around 340 euros.

So I tried to order the board directly from Commell in Taiwan. Their salesman had no problem with it and advised me how to proceed. The price was somewhat more favorable - \$220 per piece. For delivery I could choose either DHL for \$73 or EMS for \$55. They sent me a PDF pro forma invoice by e-mail, which I printed, signed, scanned and sent back. Then I sent them the given amount by transfer to the e-bank account (delivered in 2 days). Subsequently, a confirmation and EMS tracking number of the shipment came. As I was ordering from abroad for the first time, I did not yet know exactly how things are with customs, etc. In about 3-4 days, a call to pick up the shipment at the customs post office in Klamovka arrived. There, I had a little fling between the officials like noodles in a bunch - from the delivery of shipments to the customs officials (there, to my surprise, they assessed the duty at 0%, so I only had to pay 19% VAT, but again from the entire amount including postage, not just from the value of the goods), to the ground floor to pay the slip, with the clipping back to the customs officers and with another pile of papers back to the delivery of parcels, and there they finally handed me the desired package. I was there in the morning when there were few people so the whole thing only took about 1/2 hour. The record was packed in a normal paper box but survived unscathed. At the weekend, I went to install it on my PC.

Overview of parameters:

CPU:	LGA775 - Pentium 4, Pentium D, Core 2 Duo
CPU controller:	VRM 11 ISL6326 (0.5 - 1.6 V; 4-phase)
Chipset:	intel 945G, 82801GR (ICH7R), W83628G, W83629G, W83627DHG
PLL:	ICS954128
HW monitor:	Winbond W83627DHG component on LPC (Voltage, PWM/Speed, Temperatures)
FSB:	100-400 MHz
PCI Express:	100-133 MHz
PCI:	33-36 MHz (derived from PCI-E)
Memory:	4x DIMM 256-1024 MB DDR/DDR2 667/533/400, unbuffered, without ECC (total max. 3072 MB)
Bus:	1 x PCI Express x16 1 x PCI Express x4 1 x PCI Express x1 3 x PCI 2.3 1 x PCI/ISA (without ISA DMA support)
VGA:	integrated, Intel GMA 950 core, up to 224 MB, VESA VBE 3.0
String bag:	Marvell Yukon 88E8053 10/100/1000 Mbit Ethernet, RJ45, network BootROM
Audio:	Realtek ALC880 8-channel High-Definition Audio
watch dog:	1-255s
Connectors:	1 x IDE/ATAPI Ultra DMA 100 (ICH7R) 1 x CompactFlash II (ICH7R, shared, DMA up to HW revision G) 4 x SATA 2.0 (ICH7R, RAID 0, 1, 5, 10) 1 x 32-pin DIP JEDEC DiskOnChip socket 1 x 1.44/2.88MB floppy drive 1 x D-SUB 15 onboard VGA 1 x SPP/ECP/EPP parallel port 5 x RS232 serial port 1 x RS232/422/485 serial port 1 x IrDA 1 x 5 -pin SMBus header 1 x PS/2 mouse port 1 x PS/2 keyboard port 8 x USB 2.0 port 3 x fan (1 with PWM regulation) with speed measurement 8 x freely programmable GPIO 1 x ATX 24-pin (a source of 20 -pin) + ATX 12V aux 8-pin (required)
BIOS:	Phoenix/Award PnP BIOS 6.00PG ACPI 1.0, APM 1.2, SMBIOS 2.2, PnP BIOS 1.0 USB legacy support for Mass Storage devices 8 Mbit LPC FlashROM Winbond W39V080FA 3.3 V
Format:	full ATX 307 x 244 mm



BIOSes

type	date	description	size
	ver. 8.93	AwardFlash for BIOS flashing	33 KB
	24/10/2007	Latest official BIOS 2.3 , next official version here .	1024 KB
	7/1/2008	<p>My unofficial version based on version 2.3 of 10/24/2007</p> <ul style="list-style-type: none"> exposed a couple of hidden menus in SETUP updated VGA BIOS build 1374 from 8/28/2006 integrated graphics intel 945G (corrected error when setting refresh rate via VESA BIOS call) updated microcode for CPUID 6F6h (Core 2 Duo E6400) Marvell Yukon BootROM replaced by ROMOS 1.03 PCI 	382 KB

The first problem during assembly into the case manifested itself very soon, when it was not possible to place the board in place at all due to a physical conflict with the HDD drawer. If you look at the specifications, you can see that it is 14 mm wider than regular ATX boards, and the HDD drawer is the longest device in the 5.25" bay. So I had to cut the drawer with a hacksaw and cut 10 x 10 mm of material from the right corner, luckily there was no flatbed or connectors. Then everything went smoothly.

The power connector on the board is 24 pin ATX + 8 pin AUX 12V for CPU power. On my 350W Fortron I only have 4 pin AUX 12V, however it went plug it in there without any problem. I also installed the existing components from [the Asus P5LD2 into the board: Intel Core 2 Duo E6400 processor \(2.13 GHz\), 2x 512 MB DDR2 667 MHz Kingmax modules for dual channel, Asus EN7600GS Silent/HTD 256 MB DDR2](#) graphics card into the PCI-E x16 slot, DVB-T + analog TV tuner [LifeView FlyDVB-T Duo](#) into PCI, sound box SoudBlaster Live! 1024 into PCI and a second sound box Adonics ESS 1868 Audiodrive with 1 MB WaveTable MIDI ROM and IDE controller into ISA through which I

since this board has no additional IDE controller, only a single IDE channel ICH7R, I decided to switch partially to SATA (I could buy an IDE controller to PCI, but I want to save slots) . Anyway, I was already eyeing a bigger disk. Everyone advised me a different brand, so I finally decided on the [Western Digital RE WD5000ABYS](#) 500GB SATA II disk with 16MB cache. Although my last experience with WD was not the best, but the situation changes quickly and you cannot draw conclusions from the death of one drive. For greater compatibility, I wanted to leave the second drive in the drawer on PATA and connect it to the SATA controller. Small handy IDE/SATA adapters are sold for this purpose, I used [the Kouwell KW-5562](#) . The reducer is just a piece of flatbed with a converter (here specifically Sunplus SATALink SPIF3811A), it has a 40-pin IDE connector with sleeves on one side, which I inserted into the IDE drawer, and on the other side is a SATA connector for connecting a cable like a SATA disk. The power supply for the converter still needs to be connected with a small molex (neither IDE nor SATA contain any power lines). The reduction works completely transparently without the need to install any drivers, including UDMA modes. But she didn't get along well with the ATAPI DVD-RW drive, the system froze when copying or directly at boot (in the case of WinXP). I must also mention that working with thin SATA cables is much more convenient than with IDE cables. My concerns about SATA compatibility turned out to be odd and everything works [perfectly](#) in DOS , more [here](#) . Only Windows 98 SE is not able to work in enhanced mode (more than 4 devices at the same time), but I still use IDE combined mode. I then connected Teac CDW-524EK and NEC ND-4550(1)A distillers to the ICH7R channel. I connected the CD-ROM and the ZIP to the IDE controller on the ISA sound box (as I used to run it on [the Octek Rhino II ZX-AT](#) .

Previous experience showed that passive cooling of the northbridge i945P is not very good (the temperature of the NB cooler significantly exceeded the temperature of the CPU cooler and it didn't allow me to keep my hand on it for too long) and the same goes for the i945G, so I screwed [a small 40x40mm 7V fan](#) on it (between the 12V and 5V branches) which brought the temperature down to around 45°C without any noticeable increase noise. Here are some photos from the assembly:



The board is very well equipped with various DIY connectors. At a time when even LPT and COM ports are disappearing, this MB offers 1 LPT (SPP/EPP/ECP) and even 6 serial ports (COM3-6 are realized by a 4-fold UART Fintek F81216D on the LPC) and configurable in addition! COM2 can work in RS232, RS422 or RS485 mode. For COM1 and COM2, the supply voltage +5 V and +12 V can optionally be output to pins 1 and 9. So I can connect all my gadgets without any problem. The connector for Type II CompactFlash cards (i.e. IBM microdrive) is also interesting. It is shared with the IDE channel ICH7R. A jumper can be used to select whether the CF should be Master or Slave. Unfortunately, it is not possible to switch between drives on the IDE channel and CF via software. It's just a shame that I didn't have this earlier to tune the diploma. I also found out then that the CF slot does not support DMA. The DMA_RQ and DMA_ACK# lines are not connected to the IDE controller (according to the CF 3.0 specification). It is said that it should be solved only in the latest HW revision G. However, a CF/IDE reduction can be easily made or bought for a few hundred. In addition, there is also a DIL32 socket on [the DiskOnChip 2000](#) of the JEDEC standard. I haven't had a chance to experiment with that yet. And finally, we have a standard 5-pin SMBus header for connecting various sensors, serial memories and other I2C circuits.

After turning it on, the system started without problems and I went into SETUP (Award BIOS 6.00PG). I set the SATA controller to IDE - combined mode, where SATA1 and SATA3 ports act as primary master, primary slave. The IDE channel on the ICH7R is then secondary. With BIOS version 2.1 this setting froze on boot (I had to set SATA as secondary), but the newer BIOS version 2.3 fixed it. The integrated graphics can be turned off completely or, on the contrary, preferably used instead of the VGA in the PCI-E slot, or left to auto, when the integrated VGA is initialized only if there is no other VGA in the slot. I also turned off the onboard sound system like HD-Audio. Other settings are pretty standard. Legacy support for USB Mass Storage devices is automatic. If I left the CF card inserted in the USB reader during boot, it automatically appeared as another drive E: (3rd primary partition) in DOS. In the HW Health monitor, there is an automatic regulation of the speed of the CPU SmartFan fan, where the monitored temperature can only be set up to 40°C, so my fan was practically always running at full speed. I already wrote on tech. support, if they could add higher limit temperatures and I got a test version with settings up to 55°C. Overclockers will be disappointed, however, because this board **has absolutely no frequency and voltage settings for buses and CPUs**, except for memory settings. However, I already got the datasheet for PLL ICS954128, which can generate FSB frequency up to 400 MHz, so I will try to add support to the [SMB](#) program. The Vcore voltage, the multiplier (within the allowed range of values) and the EIST can also be set in software using the relevant MSR registers of the CPU, so it will somehow yield :-).

As far as operating systems are concerned, Windows survived the motherboard change this time in good health. After all, replacing the i945P with the i945G is not as brutal as switching from the iBX440. There was only a new detection of all devices. No new drivers were needed for Windows XP. For Windows 98 SE, the same applies as I wrote about the [Asus P5LD2](#) board. The shutdown problem (probably closely related to the nVidia ForceWare drivers) persists. No one has investigated anything on [MSFN](#) either, so it turns off via restart. At least I verified the functionality of the modified nVidia [ForceWare 82.69](#) drivers on the GeForce 7600GS and 7300GT PCI-E. As far as I know, no one has tested the 8xxx series yet.

Linux just had to rewrite the mountpoint configuration / from `root=/dev/hde4` to `root=/dev/hda4` and it booted without problems. It's just that my disks were very slow, a ridiculous ~2.5 MB/s when copying. While compiling the kernel, I found that this problem occurs if I have the /Device Drivers/ATA/ [generic/default IDE chipset](#) driver compiled directly into the kernel. When I selected it as a module (I left the other IDE/SATA drivers in the kernel), did my disks start instead of hd? detect as sd? (so I set `root=/dev/sda4`) and the speed increased dramatically. Apparently, during HW detection, this driver was initialized earlier than the native SATA driver, because I have IDE mode enabled in the BIOS and thus prevented the introduction of a faster SATA driver. DOS did not notice any HW changes.

Now I was hoping that when I finally have the longed-for ISA slot, back with my ISA sound box, I will start full-fledged sound under DOS for all the good old games, demos, trackers, etc. even the exchange of several different sounds failed. When I sent a query to the tech. support, a fairly clear and terse answer came:

```
> Currently I have a problem with running an ISA sound card under DOS: I have
> ESS1868 ISA PnP card fully SB Pro compatible (it worked fine in
> PIII-iBX440 mobo with ISA slot). When I run the ESS configuration utility
> it successfully recognizes it and sets proper ID, DMA, IRQ but I cannot hear
> sound. All programs hang when playback should start or don't recognize
> soundcard. It seems that I/O ports decoding works fine because I can set
> mixer options and other things in DSP. But maybe problem in IRQ/DMA.
> What I tried:
> a) use various DMA 0,1,3 and IRQs 5,7
> b) set IRQ 5/7 to be reserved for legacy card in SETUP/Plug&Play options
> (to prevent other PCI devices from using this IRQ)
> c) disable APIC
> d) disable ACPI
> e) under Windows98 works only sound from windows apps not from DOS apps
> f) I tried the original Creative SoundBlaster AWE64 ISA but with the same result
> (driver initialization OK but hangs/no sound)
>
> What should I set in SETUP for maximum ISA compatibility? Or do I need
> some special tool for initializing the PCI/ISA bridge? Is the onboard
> ISA really fully compatible or it has restrictions to DMA/IRQ signals?

(5) Intel's chipset no longer supports ISA DMA Mode.
    therefore some ISA Cards will not be supported.
```

Unfortunately, the only thing that can be said about that is that they are right. After a bit of googling, I found [this intel document](#) that describes connecting a PCI-ISA and LPC-ISA bridge (Winbond W83628 and W83629 are used here) to a system with intel PCI-E chipsets. For ICH6 and later, the REQ[A:B] and GNT[A:B] signals have been dropped, without which the ISA DMA protocol for communication with the PCI-ISA bridge cannot be implemented. And since SoundBlaster needs DMA (in addition to MIDI and Adlib sound), it's all bullshit. There is not a word about it in the board's specifications or manual, so I'm pointing it out here. If I had known in advance, I wouldn't have gone through with it. As for the SB emulation on SoundBlaster Live, it also does not work, the reasons I described [earlier](#). So I have no choice but to keep fiddling with emulation in [DOSBox](#), [VDMSound](#), [VMWare](#), [DOSEM](#), etc. and if it doesn't work, go to another PC.

Another thing that doesn't work is the IDE controller on the soundbar. Resp. it works, but the Plug&Play enumerator is unable to assign non-conflicting resources for it, so the system bites when trying to access the ZIP or CD. However, since I've been away from school I haven't really used ZIP so I'm not too bothered by this.

Otherwise, I didn't encounter any other problems during the month of operation, everything works correctly under Windows XP and Linux. And Commell's technical support is much better than Asus's. The overall impression of this board is a bit contradictory and I would certainly not recommend it to everyone, on the other hand, tinkerers and people who deploy such HW in industry and management will certainly welcome the superior interface equipment.

On 3/16/2008, I added to my [SMB 2.06](#) program support for the HW monitor, which is part of the PC SuperIO Winbond W83627DHG. It can display the status of temperatures, supply voltages and fans. In the case of fans, you can also set the frequency of the PWM controller and thus the speed. Among other things, I found out that although this circuit allows software control of the CPU supply voltage (8-bit VID I/O), the manufacturer apparently did not connect it to the VRM - in input mode, the VID always reads FFh, in write mode only the value changes in the registry but not Vcore. Sample output:

SMBus Communication Program 2.06 (C) 2001-2008 by Martin Rehak; rayer^list^cz
Compiled by GCC 3.4.5 at 02:26:16; Mar 16 2008 (Win9x/NT/2K/XP compatibility)
Designed for motherboards with southbridge i82371(PIIX4) or i82801(ICHx) only!

Winbond W83627 at ISA bus I/O base address: 290h
CPU temperature = 57°C, AUX temperature = 51°C, NB temperature = 49°C
CPU Vcore = 1.272V (limit: low = 0.000V, high = 1.744V, VID = FFh)
NB +1.5V = 1.584V (limit: low = 1.160V, high = 1.040V)
AVcc3 = 3.312V (limit: low = 2.048V, high = 2.672V)
+3.3VSB = 3.280V (limit: low = 0.416V, high = 1.552V)
+3.3V = 3.312V (limit: low = 0.720V, high = 3.344V)
+5V = 5.197V (limit: low = 0.051V, high = 5.376V)
+12V = 12.461V (limit: low = 0.000V, high = 5.702V)
Vin3 = 1.048V (limit: low = 1.816V, high = 1.408V)
CPU fan: 1480RPM (PWM frequency = 93750Hz, duty cycle = 43%, manual)
NB fan: 0RPM (PWM frequency = 93750Hz, duty cycle = 100%, manual)
AUX fan: 0RPM (PWM frequency = 23437Hz, duty cycle = 100%, manual)

[Back](#)

Updated 4/5/2008 at 1:29 p.m