DBBC – Disk images and installations in general
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As discussed in Onsala, I have prepared a disk image for the DBBC system. **This disk image is for use with the new Advantech Atom CPUs only**. It is a fail-safe solution, if installating is necessary and doing the system from scratch does not work.

The procedures described below are exactely what we do to build a new system, a little bit of linux knowledge is neccessary.

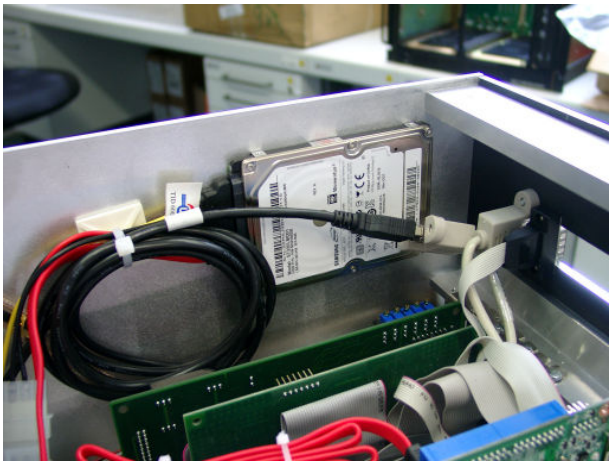
A warning before going any further: I am eventually covering three types of CPU boards. In terms of chip sets and processors these boards are VERY different. That means that a disk prepared and running for one CPU will NOT work on a different type. So switching from one type to another type ALWAYS requires a proper system disk, made by the procedures below. There are some hardware issues as well, see chapter 4.

There is an ongoing discussion about the use of Windows XP.
Only a few words about that: My favorite logic analyzer is running with Windows NT 2000, which - from the technological point of view - is from the stone age. But the analyzer is an instrument frequently used as that, and not a general purpose computer. Perhaps one should think about the DBBC in the same way.

There are four chapters:
Installation (1) - Using the disk image:
Installation (2) - Upgrading from a flash disk system to harddisk whatsoever.
Installation (3) - Doing everything from scratch (i.e. with your own campus license)
Installation (4) - Hardware issues (CAT, ADB, CPU and Power)

Now let’s get started:

About the target device: Any disk can be used, with a minimum capacity of 8 GB. We used flash disks in the past. They have their drawbacks, i.e. they complain about swap files sometimes or there is a problem with security updates. For that reason we switched over to standard 2.5 inch laptop disks. They are small and cheap and can be mechanically inserted easily. There is no problem to use solid state disks as well.



Installation (1) - Using the disk image:

The disk image contains WinXP + SP3 with the latest security updates and all drivers and software neccessary. **This image is for the latest Advantech CPUs only**.

- Attach the new target device to a linux system or a computer running from a Linux live CD (like Knoppix).

- Download the image from **ftp://ftp.mpifr-bonn.mpg.de/outgoing/p655miw/DBBC/DiskImage**.

- Due to its size, the image is compressed. Uncompress it with **gzip -d Filename.gz**

- Copy the image to the new disk with **dd if=./Filename of=/dev/target_device**. The last two commands will take a bit of time.

- If you have a look at the new device with **fdisk /dev/target_device** you will notice that there is a NTFS partition of 8GB, no matter how big the device is.

- Use a tool like **gparted** to expand this partition to the size you find appropriate.

- It could be nice also to add another partition for data for use in the future.

- Insert the new disk in the DBBC and boot. It will notice the new disk and demand a reboot. It might be neccessary to activate the swap file again. The same is true for the security updates.

- The disk image is for a **generic** system. Therefore some modifications will be necessary:

  - Change the systems name from DBBC-XX to DBBC-your_station_id

  - Change the DBBC configuration to your actual hardware, i.e. type of **CAT**, number and type of **ADB** boards, number of core modules etc (see chapter 4).

  - Install Hamachi from the desktop icon and join the network to enable remote logins.

  - Modify the standard network settings to your need.

The system should be ready for use now.

Installation (2) - upgrading from a flash disk system to harddisk.

This procedure can be used for all the CPUs we used up to now.

- Attach both the old and the new device to a linux system as above.
- Copy the system with **dd if=/dev/old_disk of=/dev/target_device**.
- Resize the NTFS partition to your needs as described above.
- Boot the new disk and modify settings as described above.
- **The copy (dd) command is very handy to have an exact backup of the running system, we strongly recommend that. You only need a second disk, best would be an identical one.**

Installation (3) - Doing everything from scratch (i.e. with your own campus license)

This procedure can be used for all the CPUs we used up to now.

- Attach a CD or DVD drive to the Advantec's PATA port.
- Attach your new disk.
- Install the WinXP operating system, including the drivers related to the particular board you are using. There are three different CPUs in use. **Have a look at Chapter 4 for visual comparison and trip wires.**

  The **AAEON HSB-835P** (Pentium 4) was the board we used in the prototypes and early systems. It tends to become quite hot, so proper airflow is of vital importance.
  Download page for drivers and manuals: www.aaeon.com.

  The **AAEON HSB-945P** (Atom N270) was used to replace the P4 board. It turned out to be not as reliable as expected, but some are still in use. Download page for drivers and manuals: www.aaeon.com.

  The **ADVANTEC PCI-7030** (Atom N270) is the board we use widely today. It is quiet and cool. There is one disadvantage: Due to the position of the VGA connector the cable has to be modified to fit in. Download page for drivers and manuals: www.advantech.com.

- Install the ADLINK software for the commercial PCI boards (PCI7200 and PCI9111HR). They can be downloaded at: **www.adlinktech.com** -> support . You need to register for that and will get drivers and utility software.

- Install the LABTOOLS from Xilinx, no licence – but registration - is required. This takes care of the drivers for the USB programmer as well. There is a flaw in Xilinx's setup procedure: Environment variables are not set automatically, this has to be done manually. **Please set the XILINX environment variable to c:\Xilinx\12.4\Labtools\Labtools**.

- Create the subdirectories where DBBC the software has to be copied, and copy of its the latest version. The latest software is available from: **www.hat-lab.com** after registration.

- modify the system settings and DBBC configuration files to your needs as in (1).

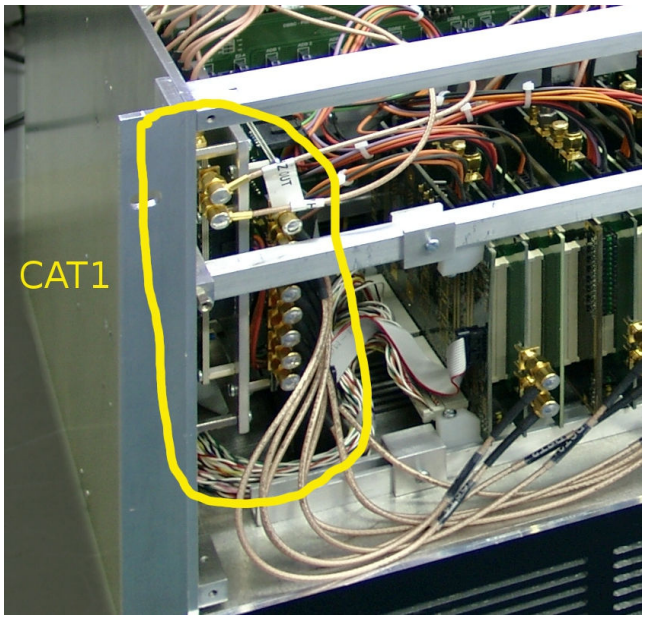
There seems to be a problem in obtaining a WinXP system disk and/or the other files. For that reason I put a lot of stuff on my FTP account. Institute policy will remove things automatically six weeks after download. So please let me know when things are missing. You should find there:

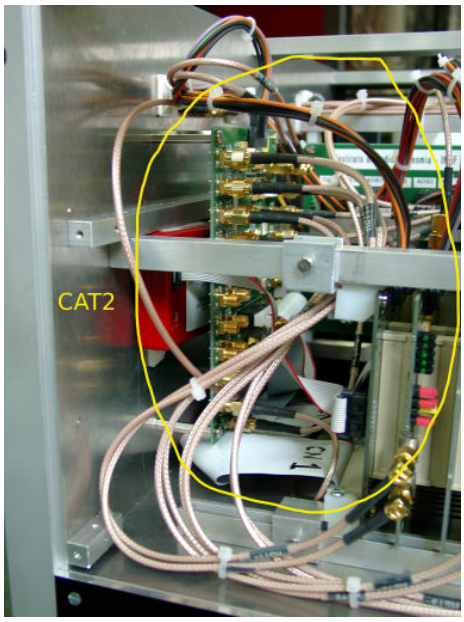
- Windows XP + SP3 installation disk English (ISO image). You will need your own license key for that.
- AAEON HSB-835P drivers and manuals (ZIP file)
- AAEON HSB-945P drivers and manuals (ZIP file)
- ADVANTECH PCI-7030 drivers and manuals (ZIP file)
- ADLINK 7200 and 9111 drivers and manuals (ZIP file)
- Xilinx Lab Tools 12.4 (ZIP file)

And here is the link: ftp://ftp.mpifr-bonn.mpg.de/outgoing/p655miw/DBBC

Installation (4) –.Hardware issues

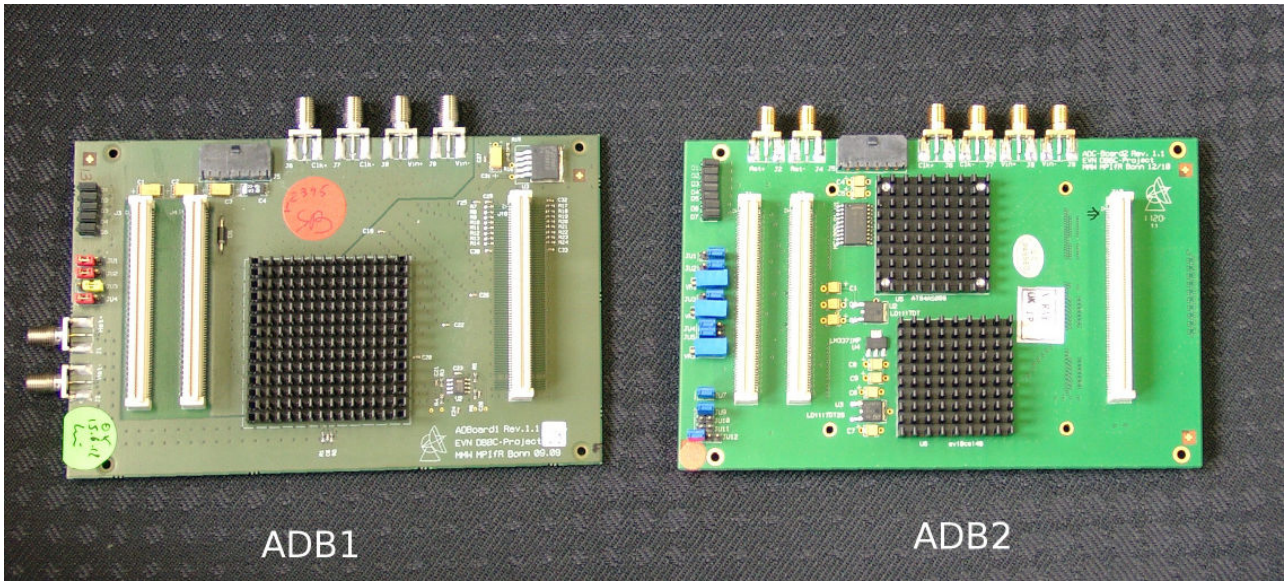
Since the configuration files which come with the DBBC software (or the pre-configured disk-image) are generic, it is important to find out about the DBBC hardware available. We are talking about CAT and ADB. The CAT is more crucial because the two versions are programmed in a different way. **So if the configuration file is wrong, the sampling clock and the internal 1pps will not be generated**.
Here is how it looks:





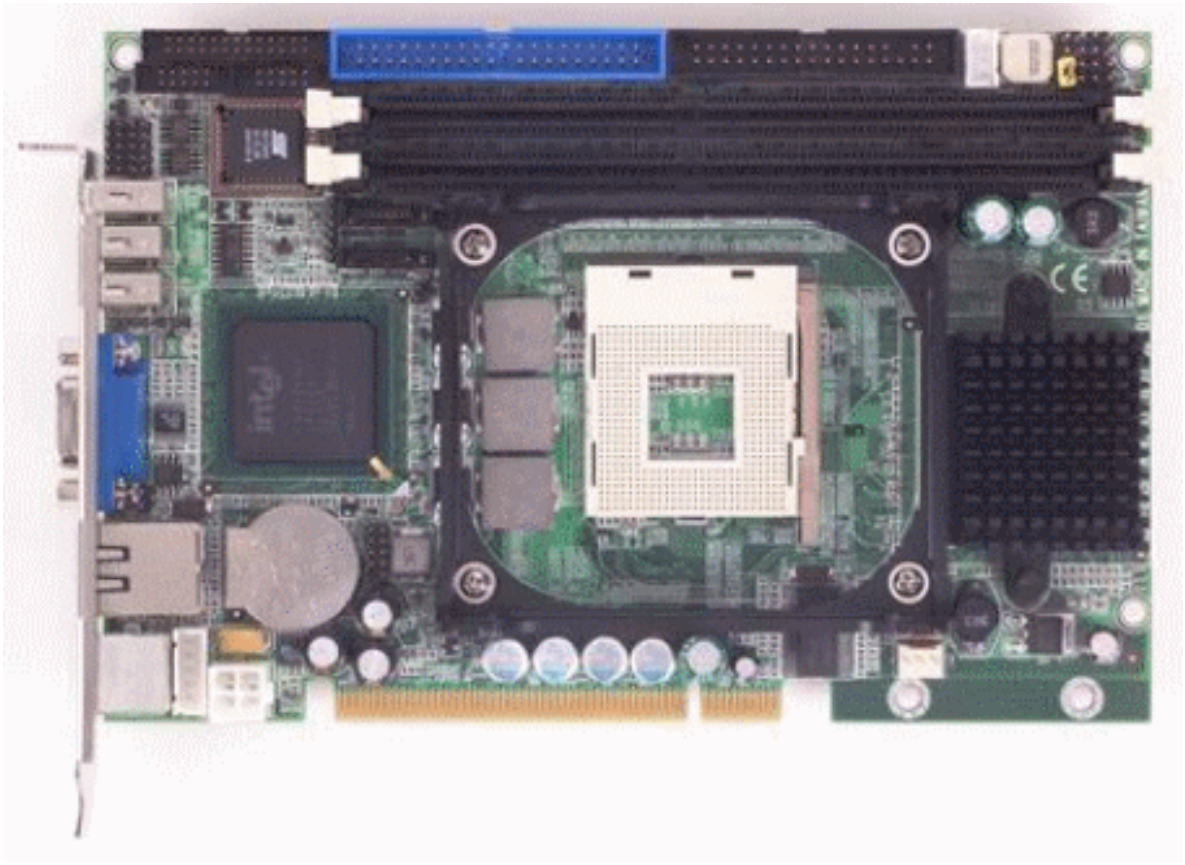
On the left there is a CAT1. It is designed with two boards on a metal base. On the right there is a CAT2. It’s a single board.

How to tell ADB1 and ADB2 apart:

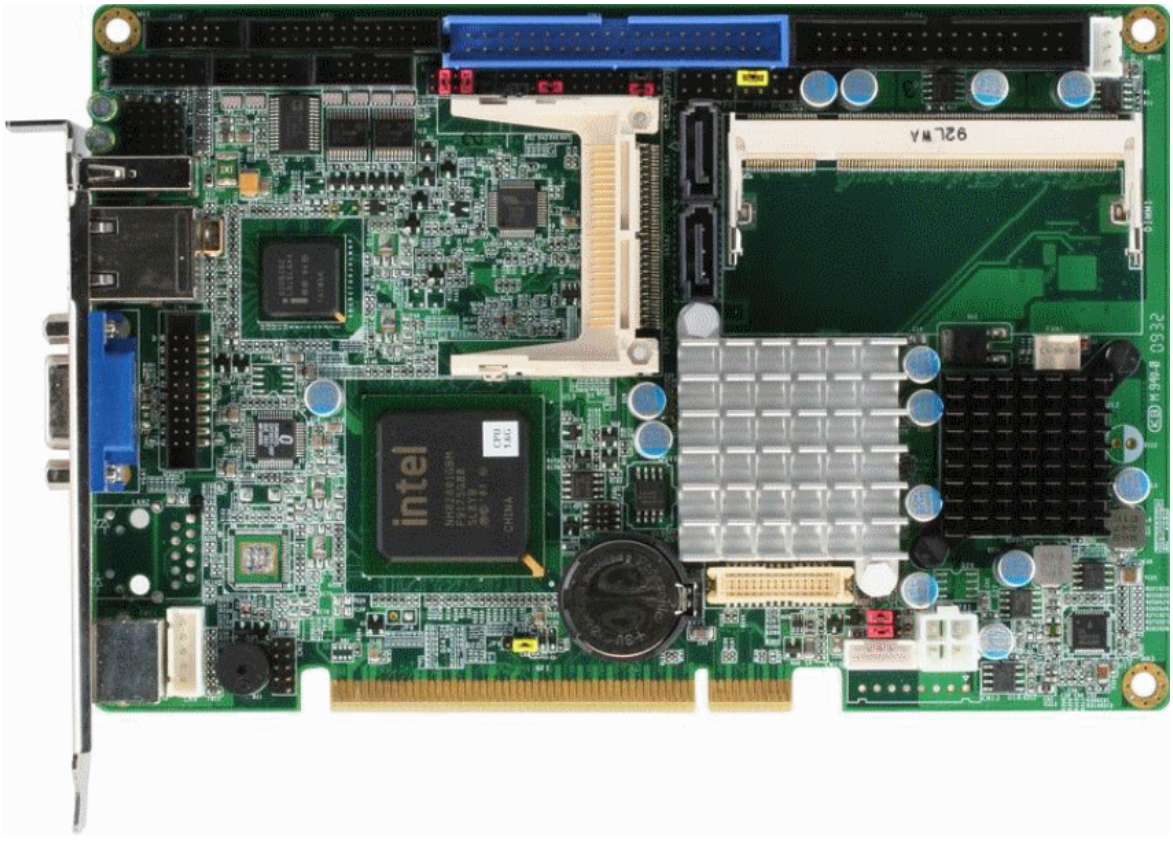


The tree types of CPU in use:

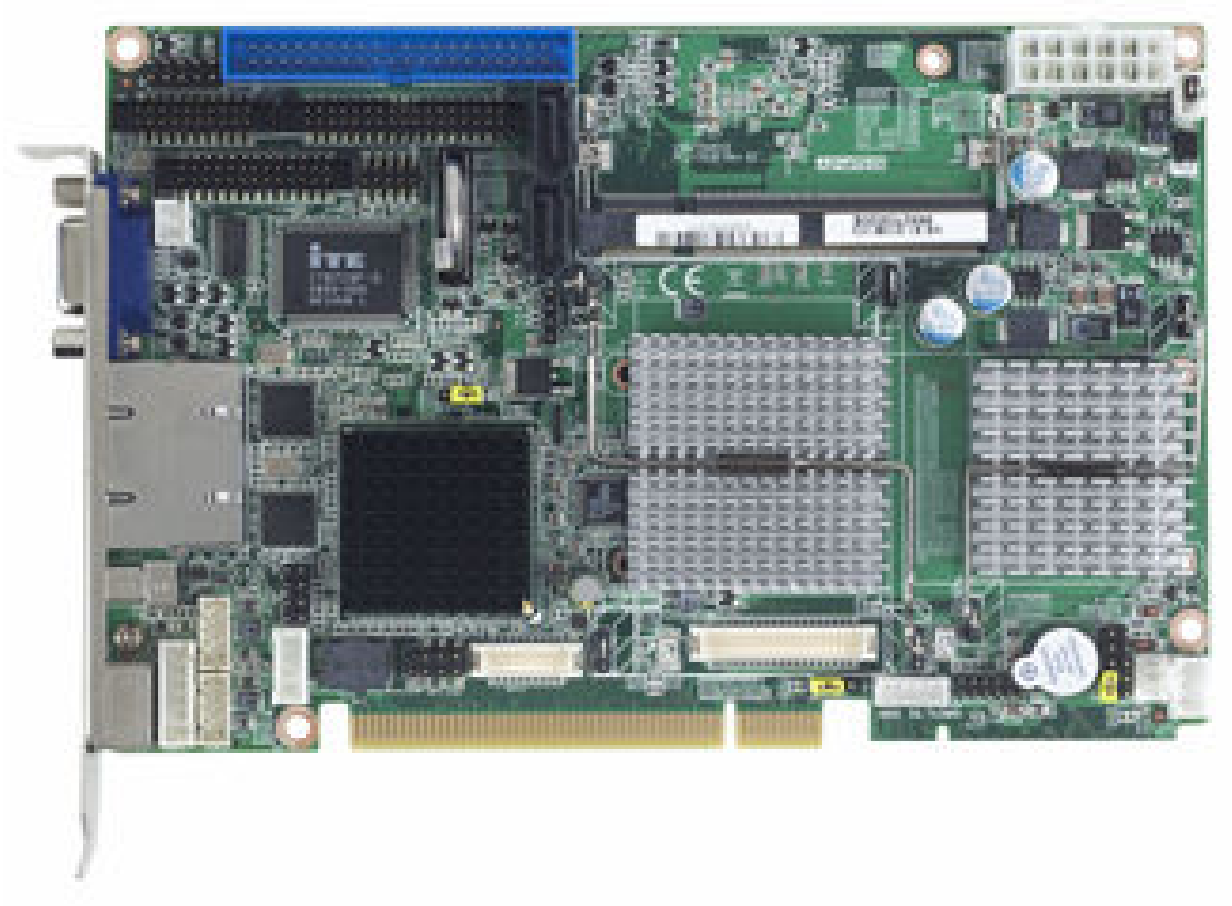
AAEON HSB-835P



AAEON HSB-945P



ADVANTECH PCI-7030



One important note: USB, serial and parallel cables are connected to headers on the board. If you change from one CPU to a different one, this is very important:
Be sure to have the proper cables with your CPU board. The headers on these boards have different sizes and pinouts. **For that reason it is not possible to use the AAEON cables on the ADVANTECH board and vice versa**. The cables of the two AAEON boards can be mixed though.

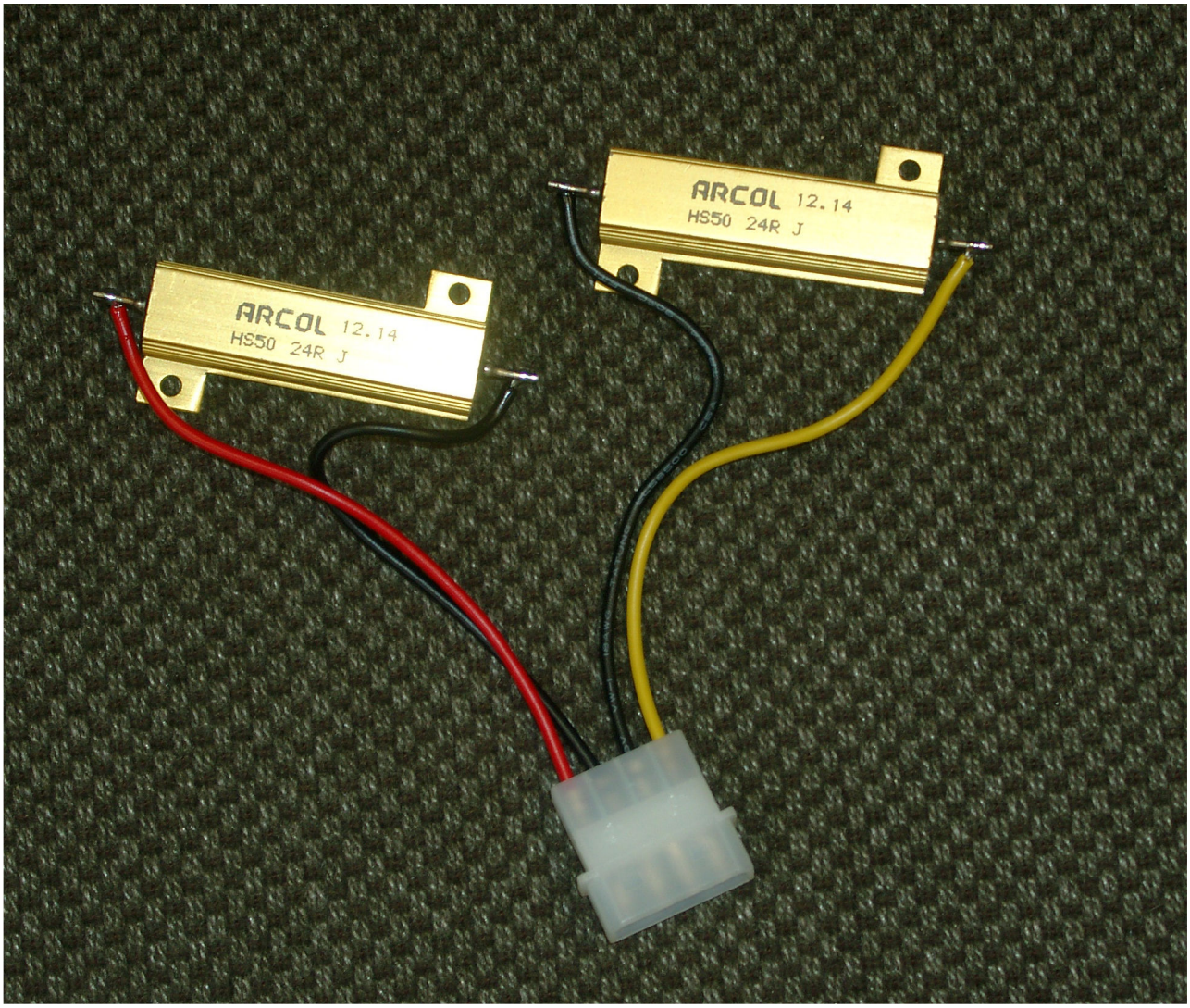
Another issue: Board makers want to make profit. For that reason the cables which come with all these boards are very cheap and **DO NOT** have a protection notch, They can be put in the wrong way easily. Please check that the color coded wire and the pin1 mark on the board match.

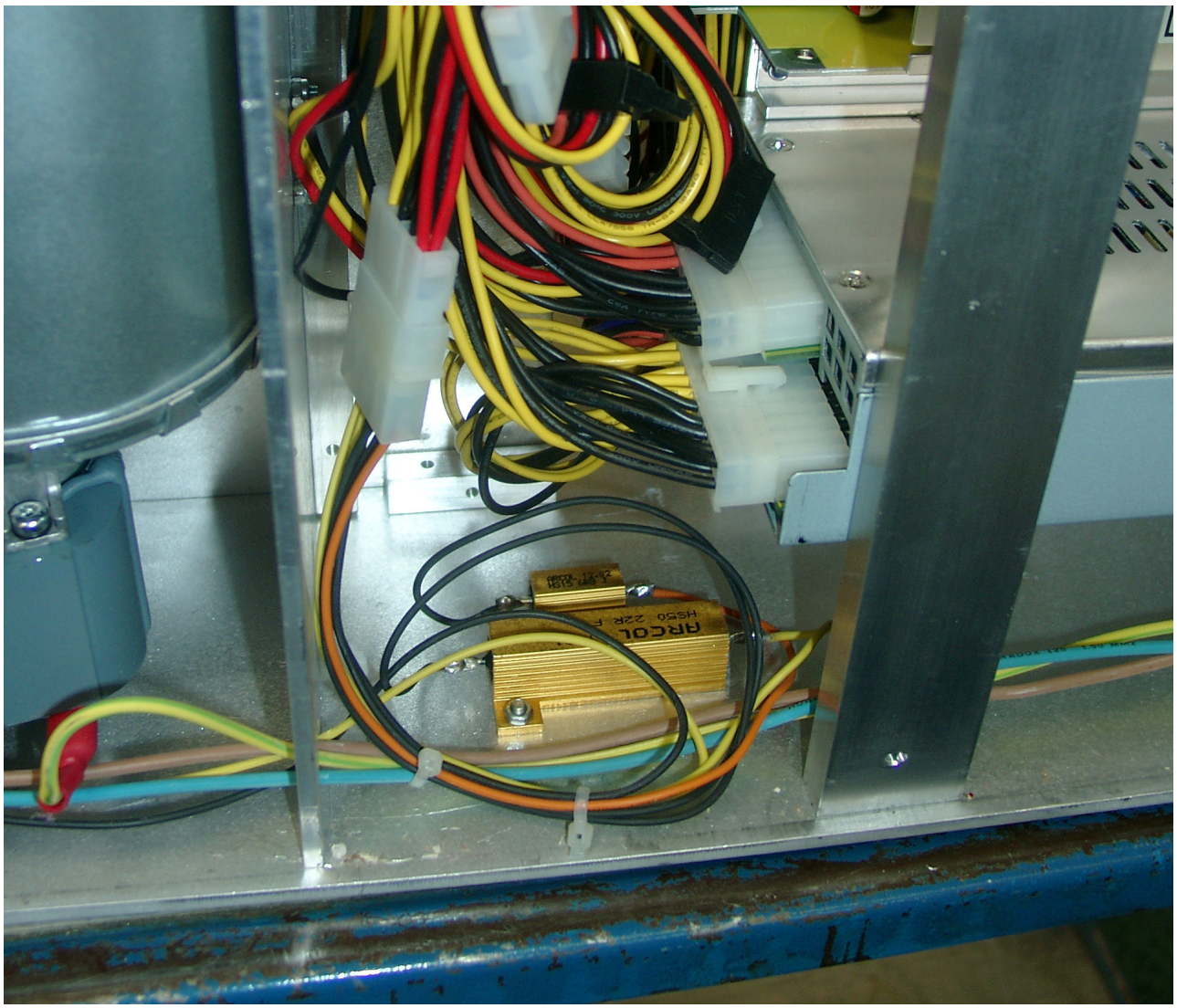
Power issues and boot problem:

One problem may occur when upgrading from the old HSB-835P to one of the newer types, with older PC power supplies mounted in the DBBC:

The new ATOM CPU boards need a **very small amount of power**. For our use this is perfect, but the power supplies we had in the beginning need a certain minimal current to work properly. The effect of all this can be that the upgraded CPU **will not boot at all**.

There is one (not very elegant) way to solve this problem. We modify PC harddisk cables and attach to large resistors (25 to 50 Ohms, 50W) to create an additional load on the power supply. These resistors can be mounted on the DBBC housing and the cable can be plugged into the PC power supply. This wastes engergy, but ensures a proper functionalty of the CPU.

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