

# **Advantech LX800 and ITE8888 ISA bridge**

Revision 1.2

Created by Eric van Vliet

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## ***Revision History***

### **Revision 1.2**

- Due to compatibility with multiple LX800 boards of Advantech I renamed the document to *Advantech LX800 and ITE8888 ISA Bridge*. This document is valid for the following boards:
  - PCM-3353
  - PCM-4153
  - PCM-9375
  - SOM-4455

### **Revision 1.1**

- New board added PCM-3680-A (Advantech PC104 CAN card)
- Added one picture of the ITE8888 menu.
- New bios version 1.16 (two changes with the ITE8888)
  - Change decode I/O address message from [15:7] to [15:4]
  - Change decode memory address input format.  
Where in V1.15 0D00H was used now in V1.16 D000h needs to be used.

### **Revision 1.0**

- First document.

## ***Introduction***

The PCM-9375 uses the ITE8888 PCI – ISA Bridge to create an ISA bus for the PC104 connector.

The PCM-9375 does not support PNP or any Jumperless, which use auto detection of address space, ISA/PC104 boards. Only manual configured boards will work.

To be able to work the ITE8888 needs to be configured so that the memory addresses needed by the ISA devices are translated from PCI used addresses to the ISA bus.

*For example if 0300H is not set to be used for ISA it will be available for all other kind of devices. If it is set for ISA it will not be available for PCI devices or other internal devices. (This means you can “kill” the board if you set board essential address to the ISA bus, easiest solution to revive the board is by re-flashing the bios chip and clearing CMOS) Avoid addresses below 100h*

I/O address space is limited to 64K (FFFFh) address space.

Memory address space is limited to 16M (FFFFFFh) address space.

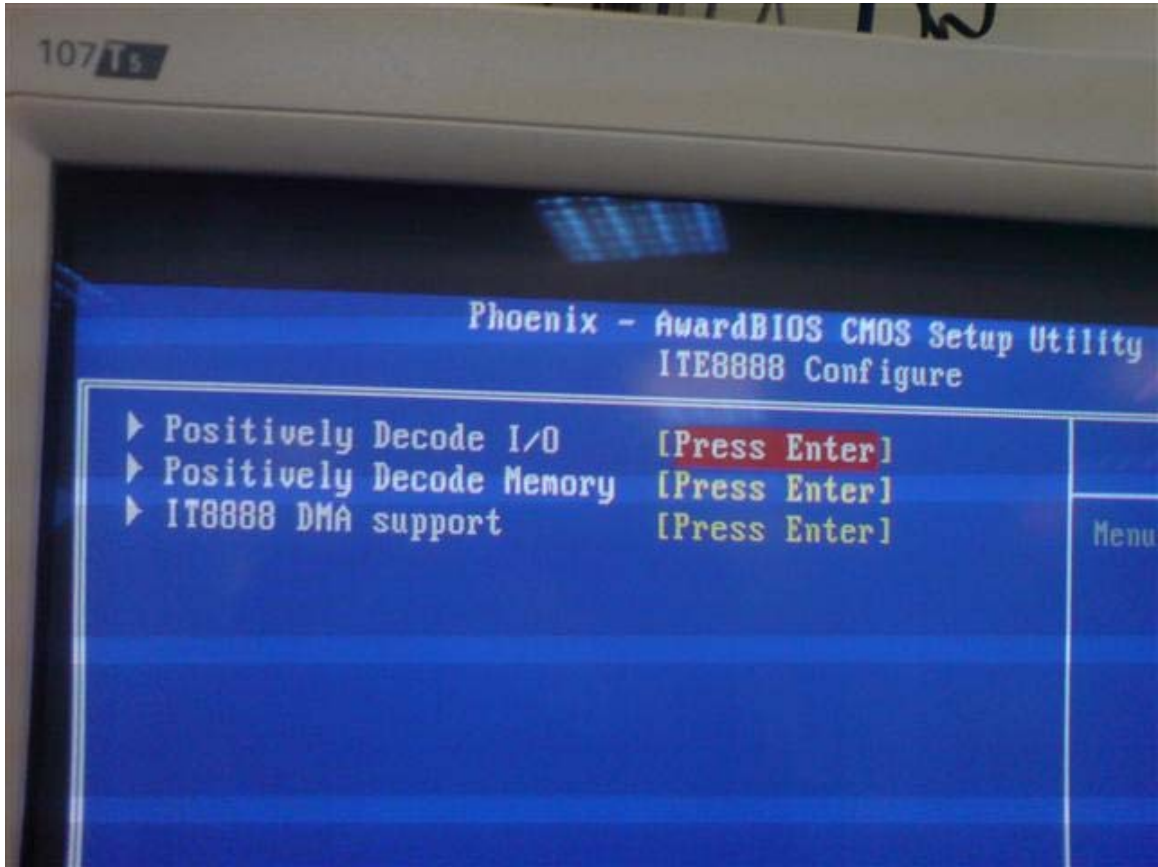
Before you use a PC104 device with the PCM-9375 you need to know the following information:

1. IO and or Memory address needed by the PC104 device.
2. IRQ needed by the PC104 device.

For this document I used the following PC104 devices to test the functionality.

- PCM-3110C PCMIA Add on card
- PCM-3643 High speed serial ports
- PCM-3664 Ethernet port
- IXXAT PC104 CAN card
- PCM-3680 CAN card

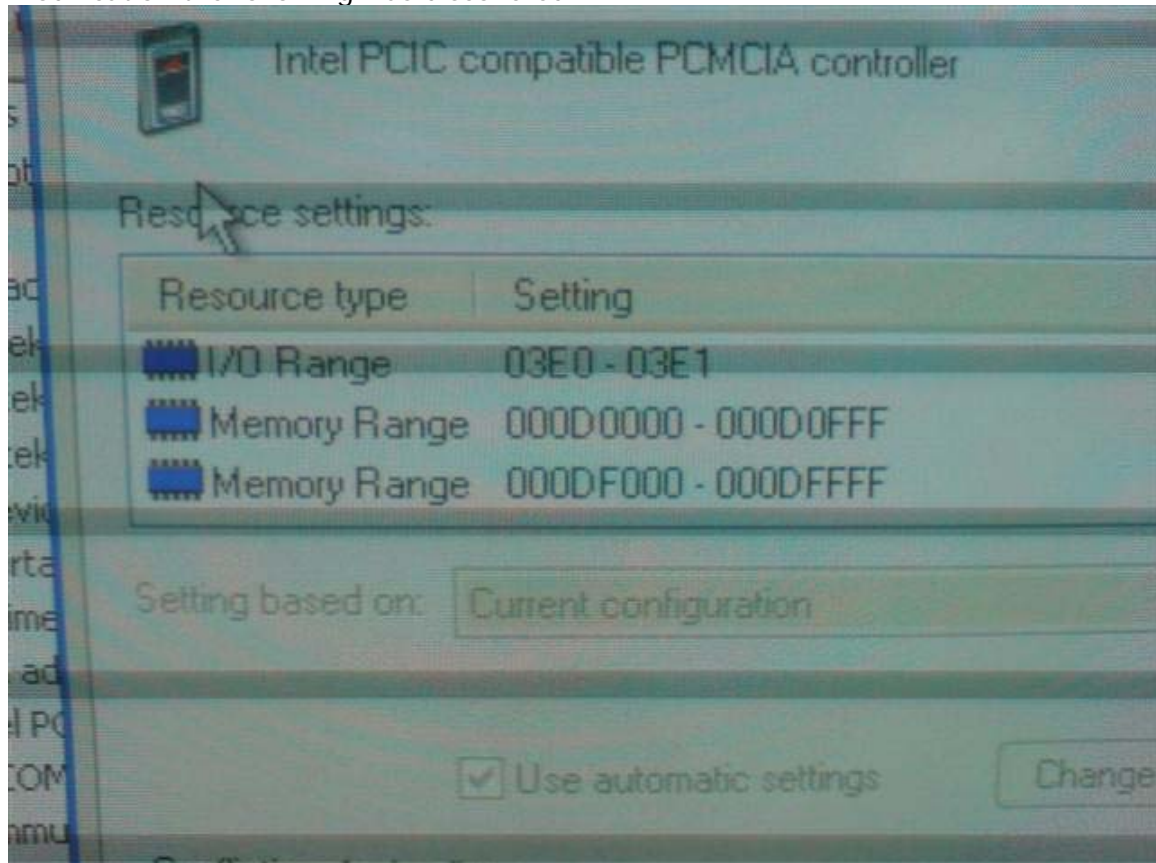
The 'famous' ITE8888 menu will have 3 options and looks as followed.



## PCM-3110C

### PC104 Configuration

The device specifies that a memory address space is needed from D8000 which is 32Kbytes big. But after testing on a different board which does not need any bios modification the following was discovered.



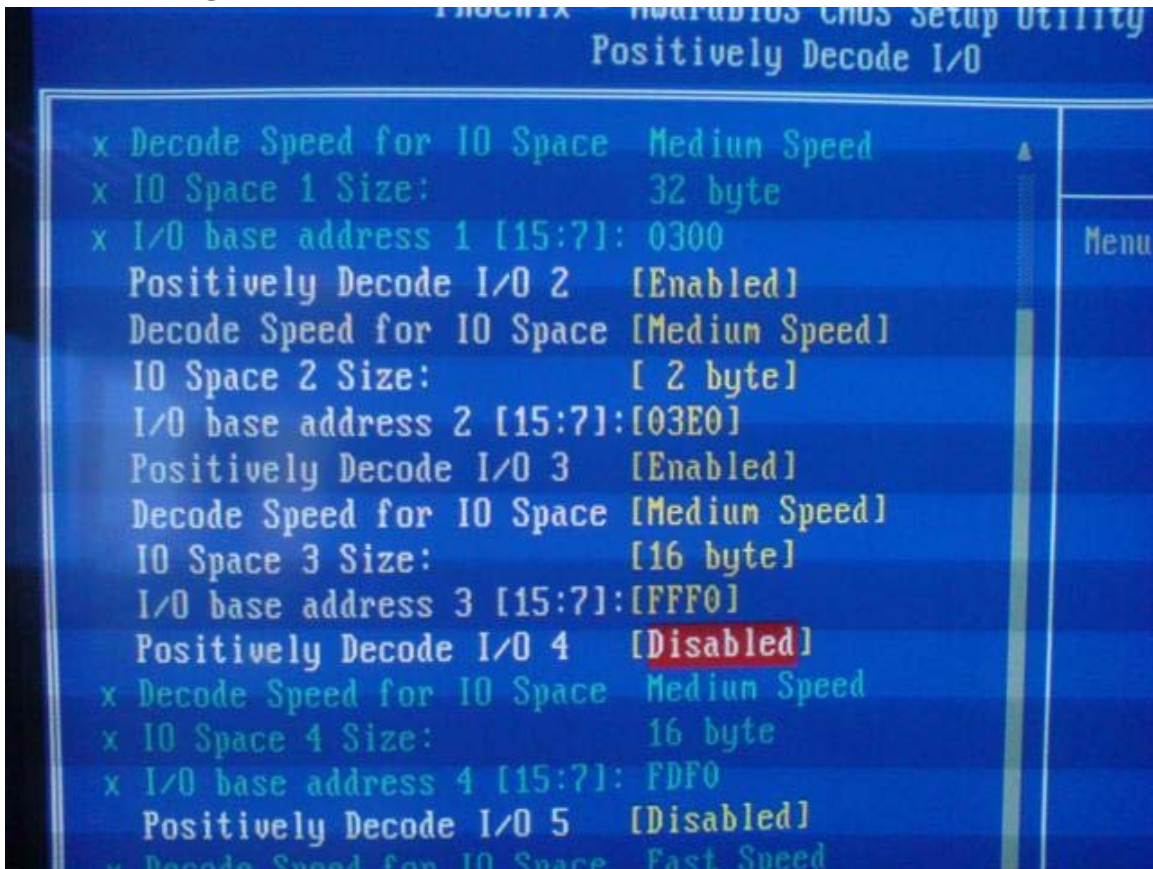
This means that the following addresses are used by the board.

IO: 03E0 – 03E1 (2Bytes)

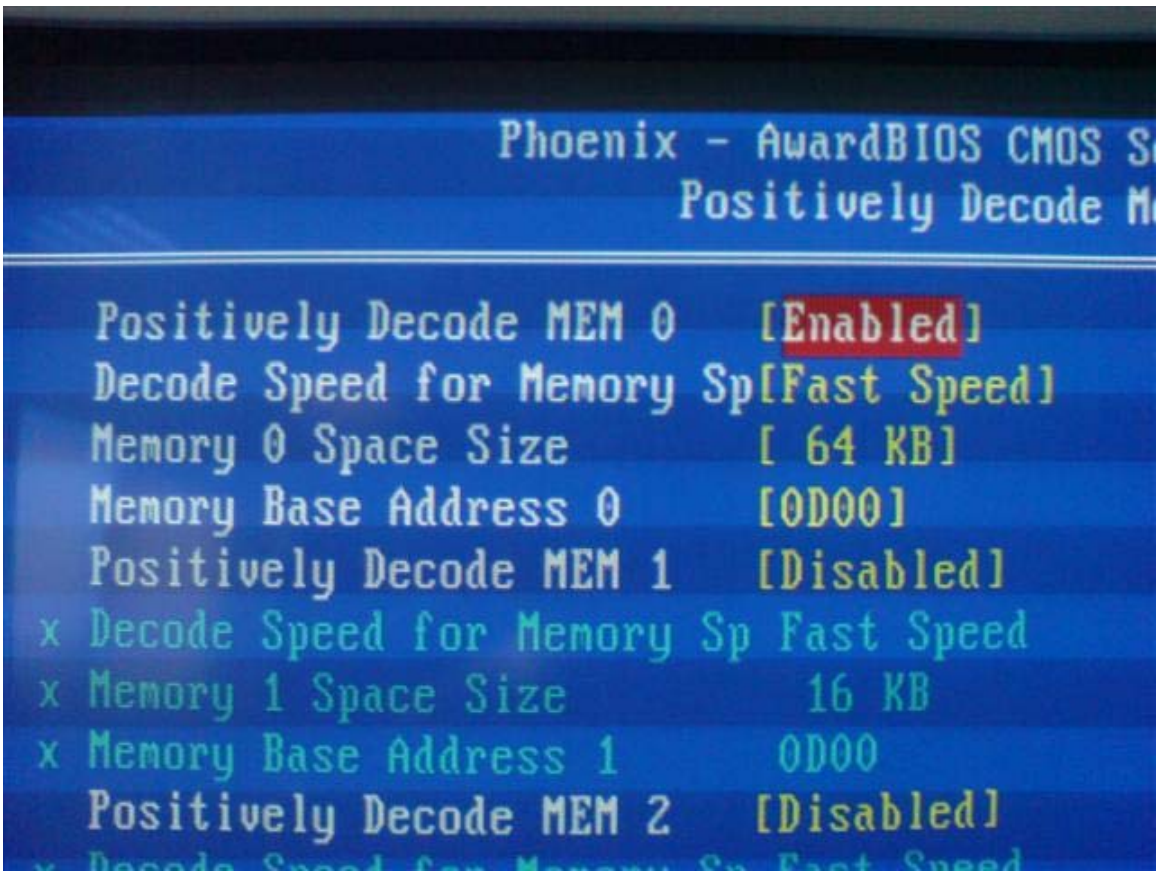
MEM: D0000 – D0FFF (4Kbytes)

MEM: DF0000 – DFFFF (4Kbytes)

## BIOS Configuration



I set the 2 bytes of IO space with base address 03E0h. Also notice that I set 16bytes of IO space at base address FFF0h. We will come to that in the OS installation.



Because the PCM-3110C uses several blocks of space between D0000 and DFFFF I decided to reserve the complete block. So I reserved 000D0000h – 000DFFFFh (64Kbytes) of memory address space for the ISA bus.



## OS Device Installation

The PCMCIA slot has to be manually installed as a Intel PCIC compatible. The address will be set automatic by Windows.

Now if you put a Memory on PCMCIA disk in the slot it will install a PCMCIA IDE Controller which will be located on FFF0h - FFFFh and interrupt 7.



This you also have to set in the bios, so also when trying out the PCMCIA PC104 module on a different type of board also check the PCMCIA device(s) you will use!





## PCMCIA IDE/ATAPI Controller

Resource settings:

Resource type	Setting
 IRQ	07
 I/O Range	FFF0 - FFFF

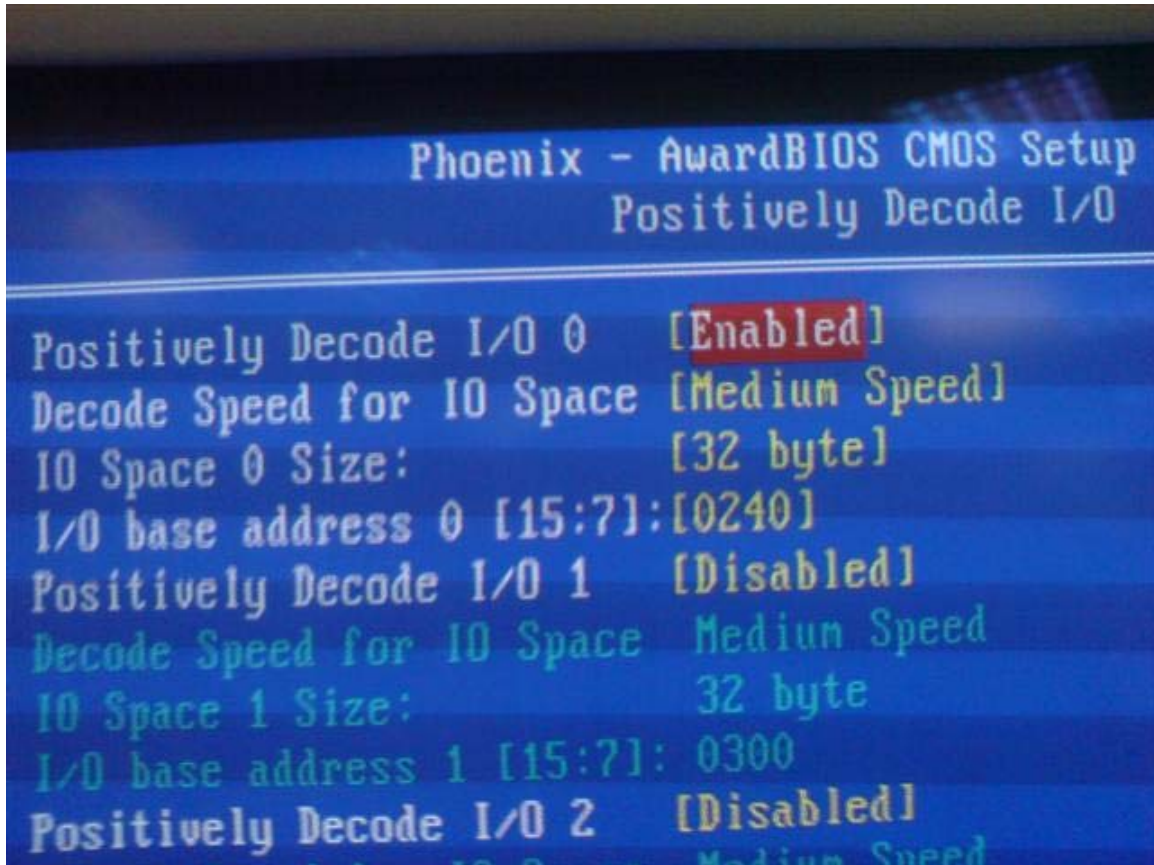
Setting based on:

## PCM-3643

### PC104 Configuration

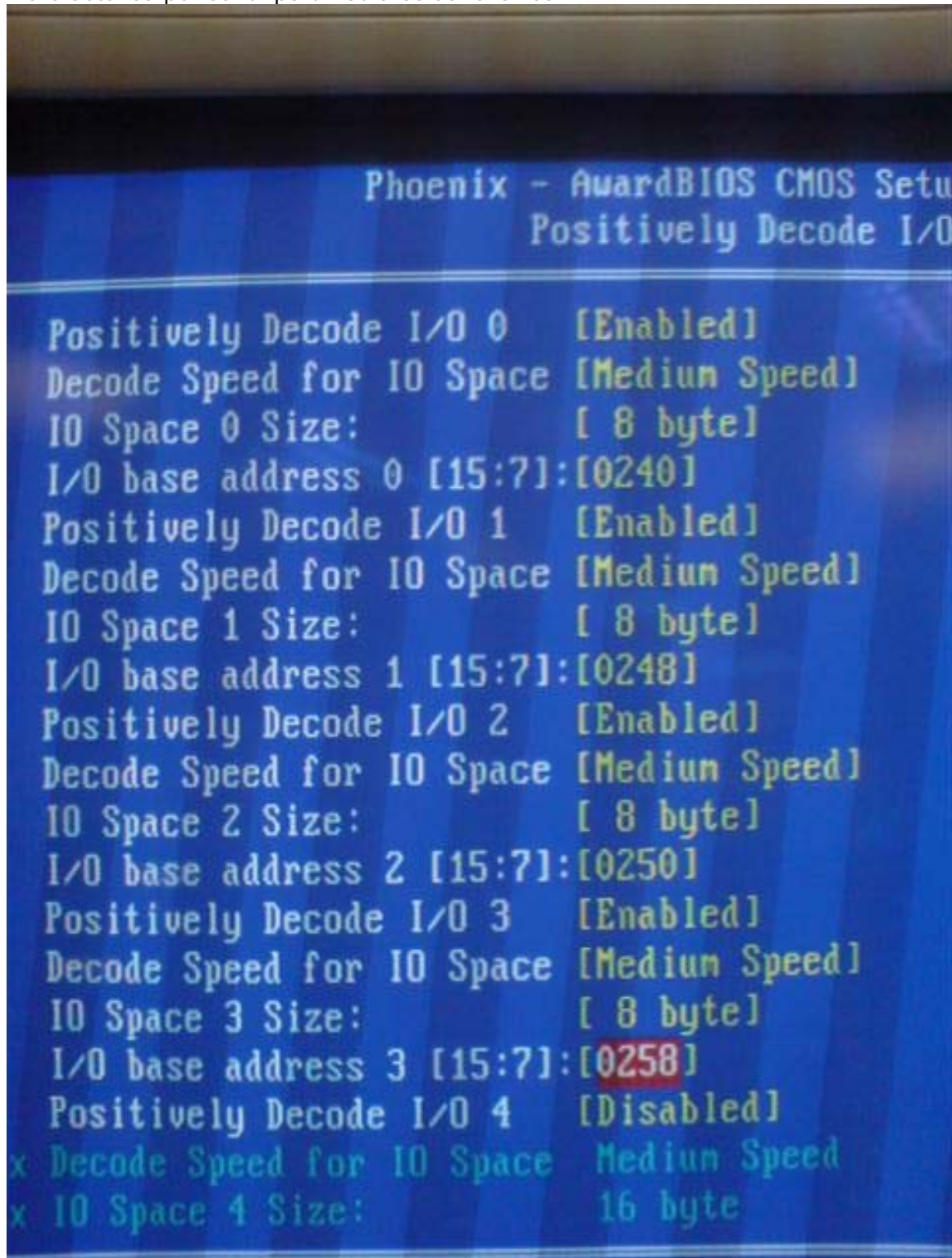
I set the device to share IRQ 7 for all serial ports. The base address of the serial ports was set to 240h-25Fh (total 32bytes 8bytes per serial port).

### BIOS Configuration

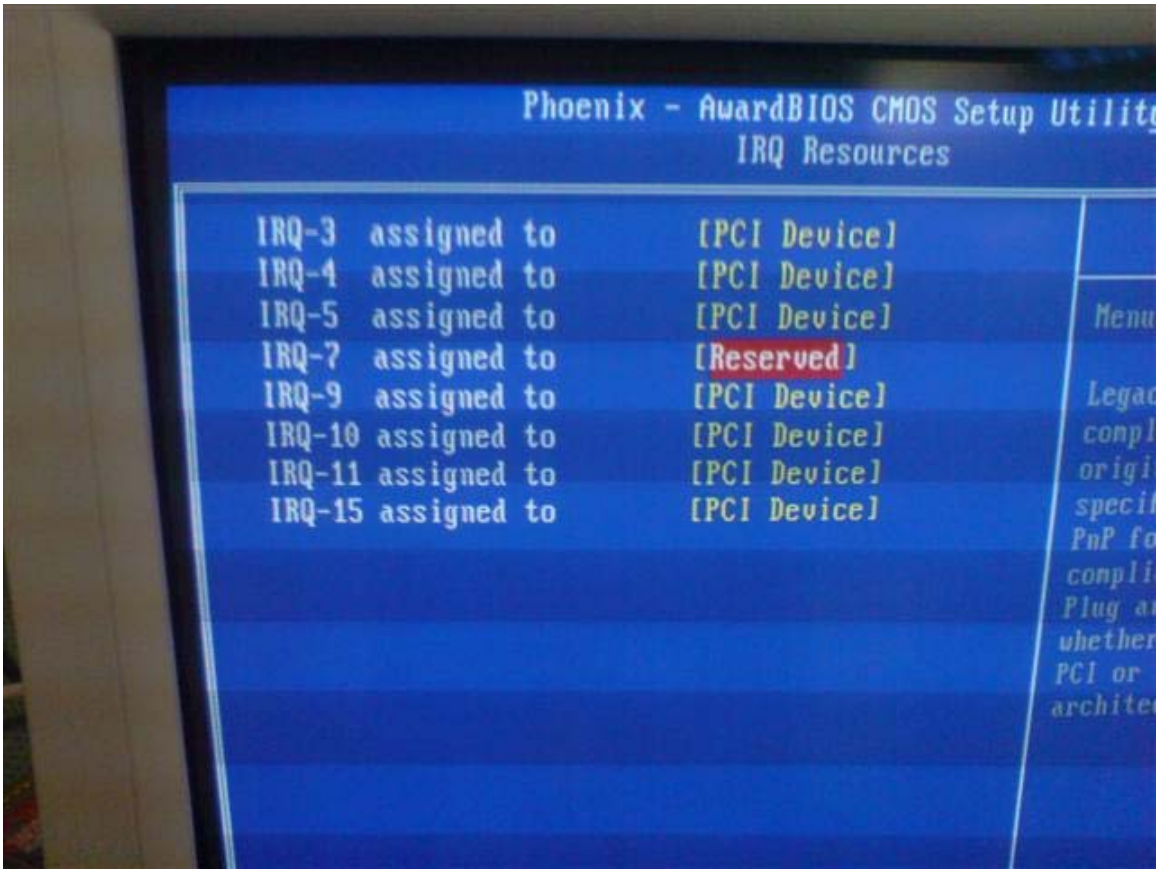


I reserved 32bytes with base address 240h for the ISA bus.

More detailed per serial port would be as followed:



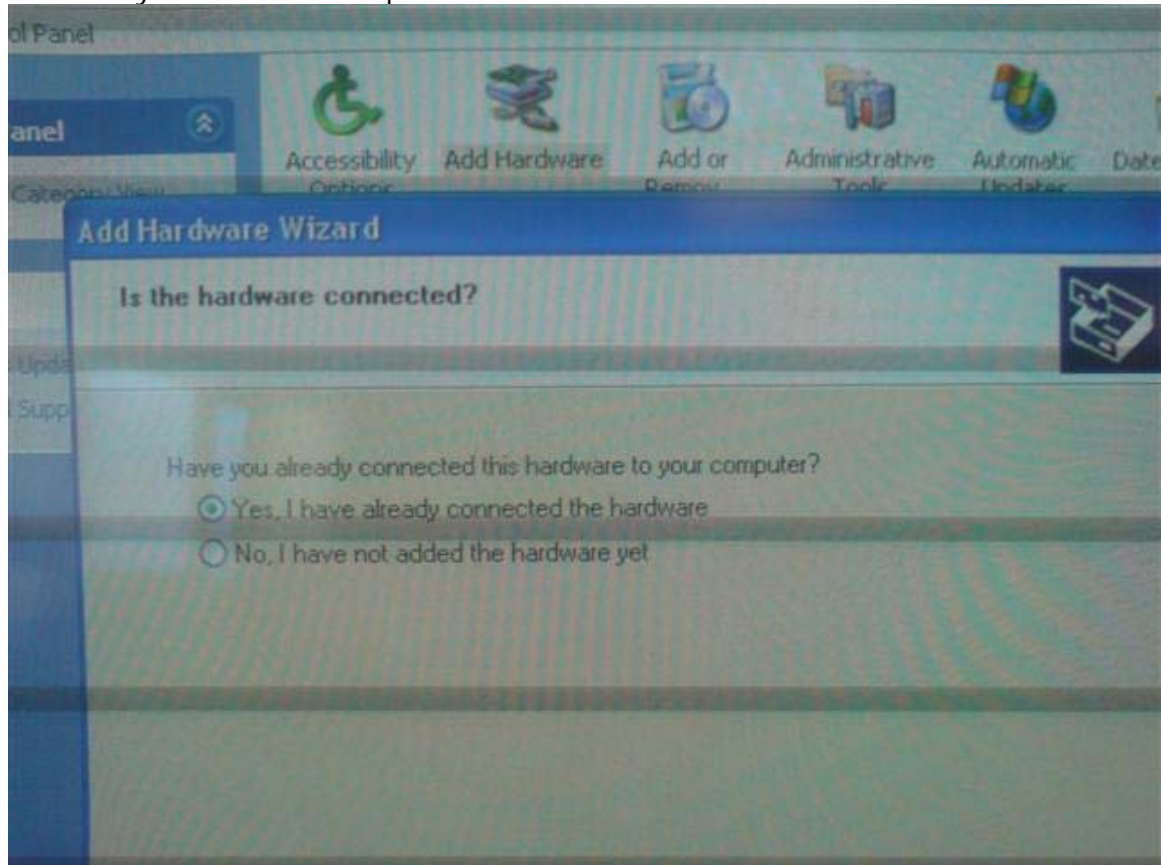
COM1: 0240h-0247h 8bytes  
COM2: 0248h-024Fh 8bytes  
COM3: 0250h-0257h 8bytes  
COM4: 0258h-025Fh 8bytes



I set IRQ 7 to reserved so it is reserved for ISA purposes only.

## OS Device Installation

I manually added the serial ports to the Windows XP installation.








Select Yes and click next.

properties or troubleshoot a problem you might be having.

To add hardware not shown in the list, click "Add a new hardware de

Installed hardware:

-  Geode(TM) Integrated Processor by AMD PCS
-  Standard OpenHCD USB Host Controller
-  Standard Enhanced PCI to USB Host Controller
-  USB Root Hub
-  USB Root Hub

Add a new hardware device

< Back

Next >

Select Add a new hardware device and click Next.

## The wizard can help you install other hardware

The wizard can search for other hardware and automatically install it for you. Or, if you know exactly which hardware model you want to install, you can select it from a list.

What do you want the wizard to do?









- Search for and install the hardware automatically (Recommended)
- Install the hardware that I manually select from a list (Advanced)

Select Install the hardware that I manually select from a list (Advantech).

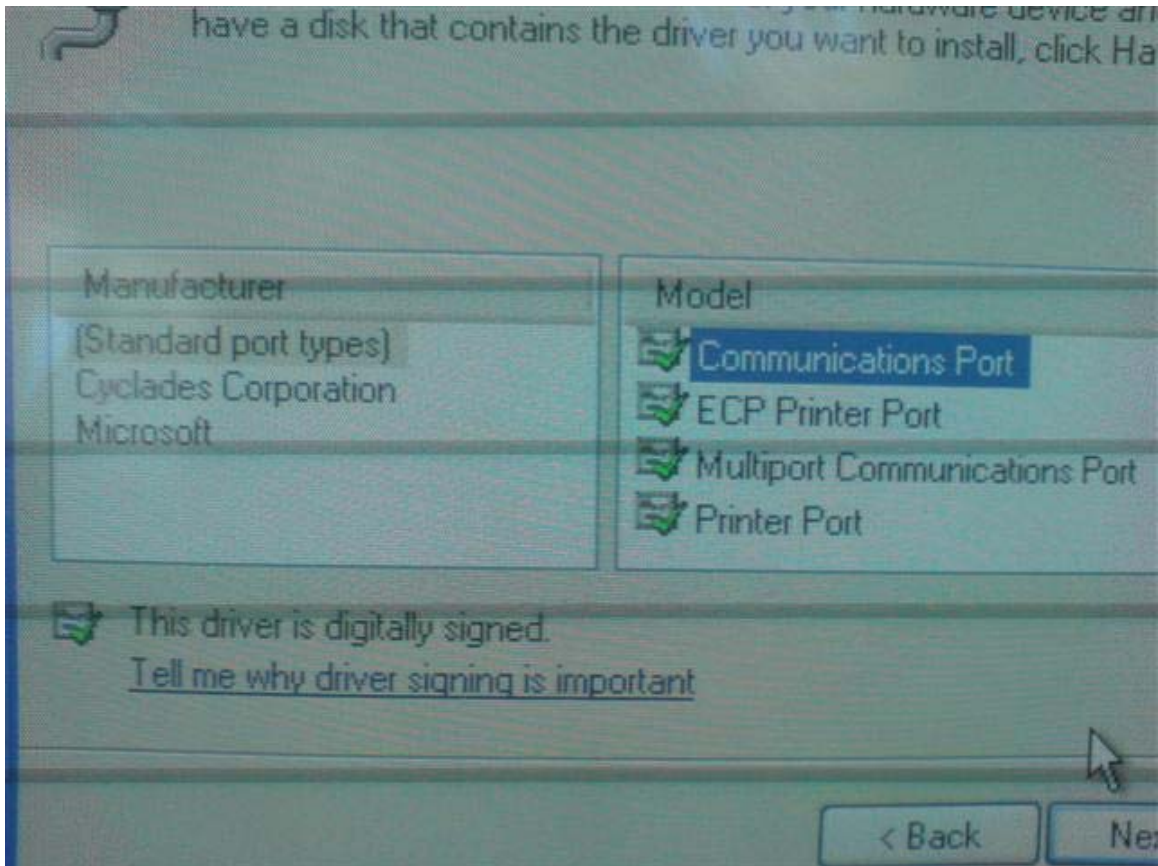


If you do not see the hardware category you want, click on the arrow to expand the list.

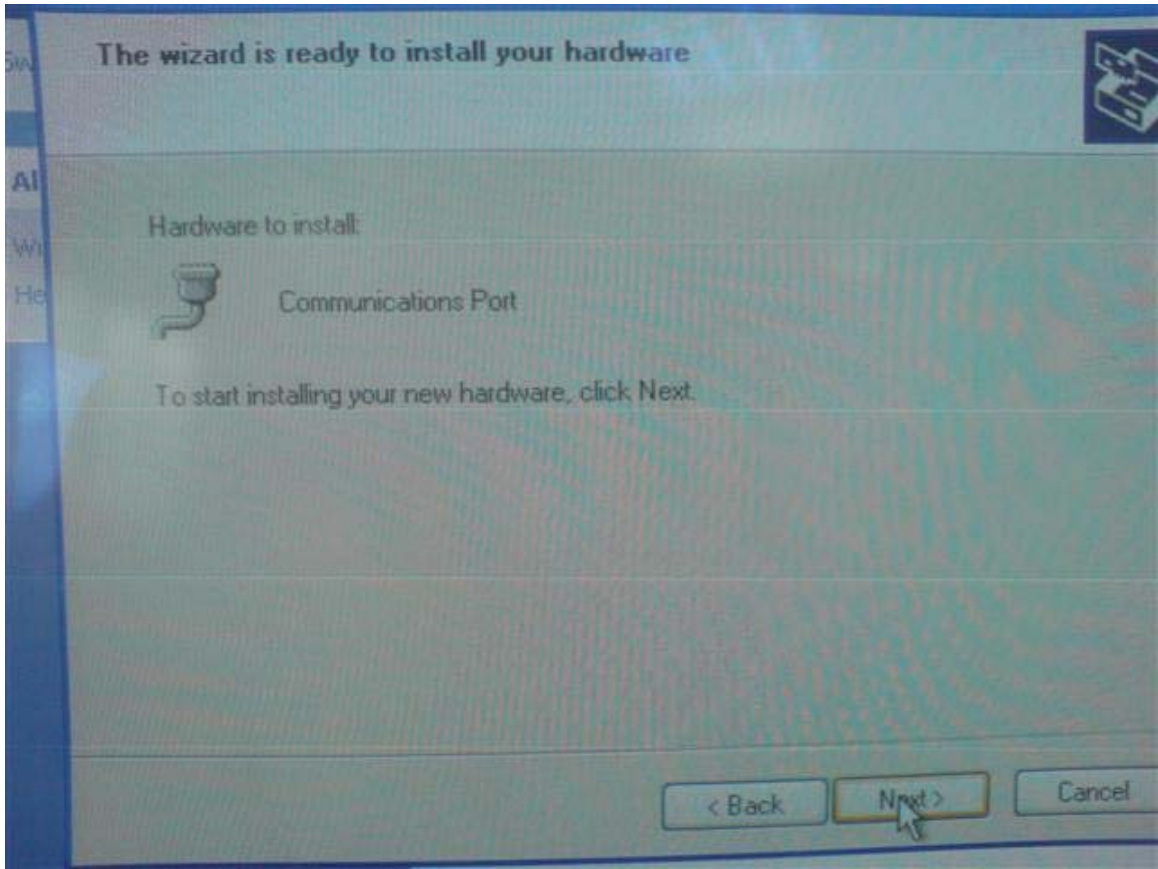
Common hardware types:

-  PCMCIA and Flash memory devices
-  **Ports (COM & LPT)**
-  Printers
-  SCSI and RAID controllers
-  Sound, video and game controllers
-  System devices
-  Tape drives
-  Windows Portable Devices

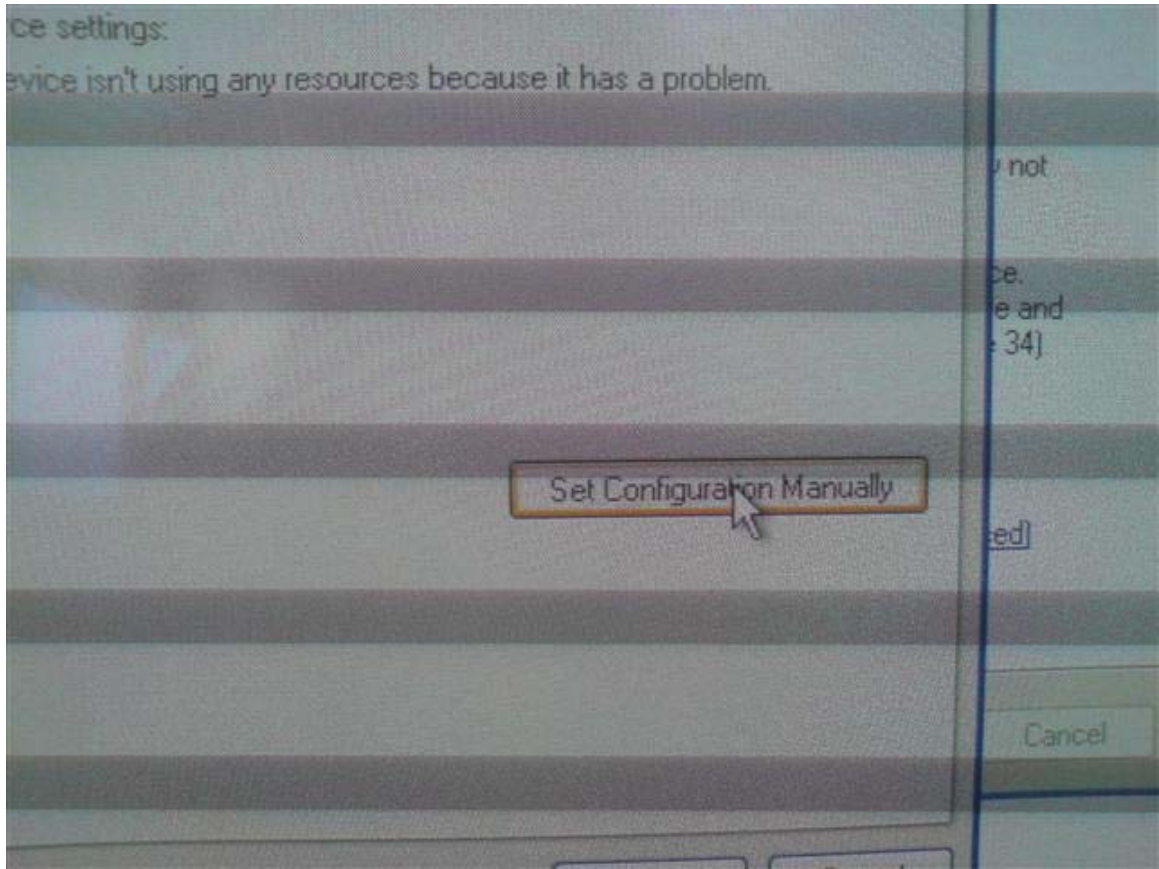
Select Ports (COM&LPT) and click Next



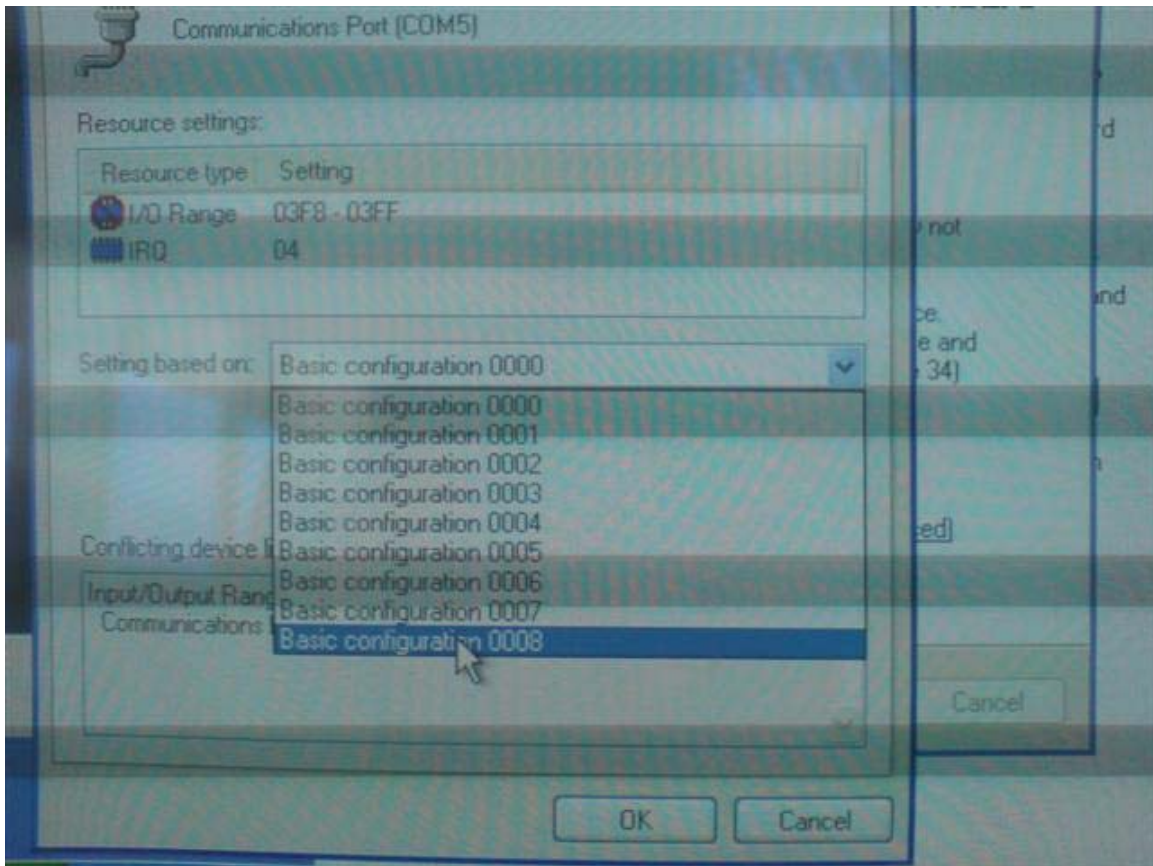
Select Communications Port in the (Standard port types) section and click Next.



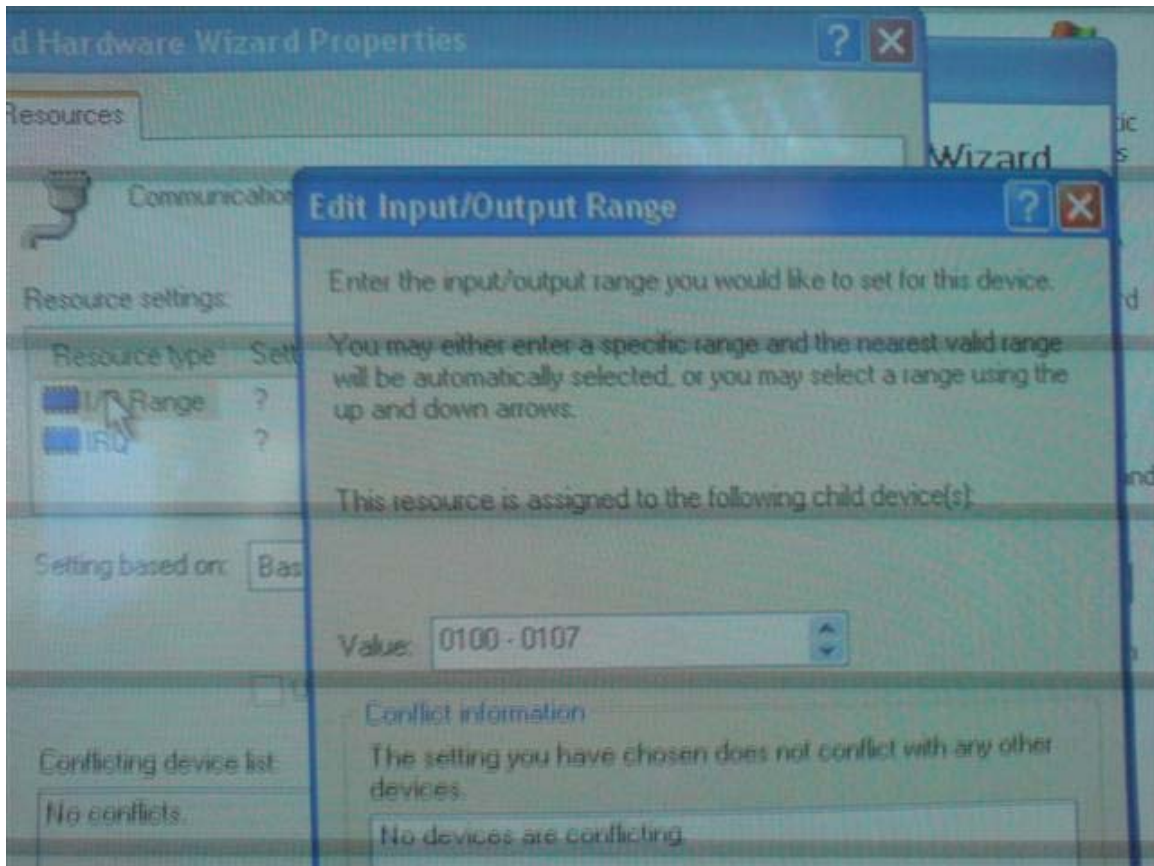
Click Next



Click Set Configuration Manually.



Select Basic configuration 0008.



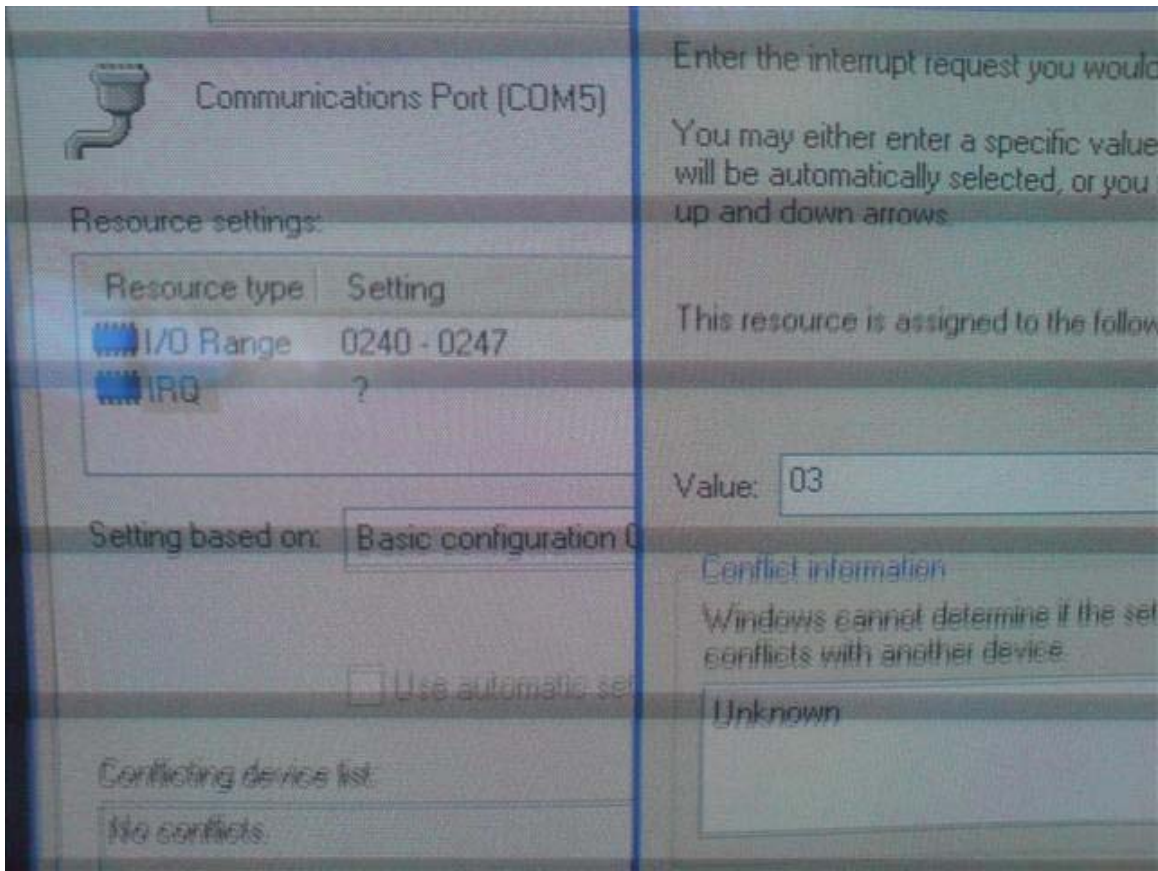
Double click on I/O Range and fill in the I/O range for the serial port.

COM1: 0240h-0247h

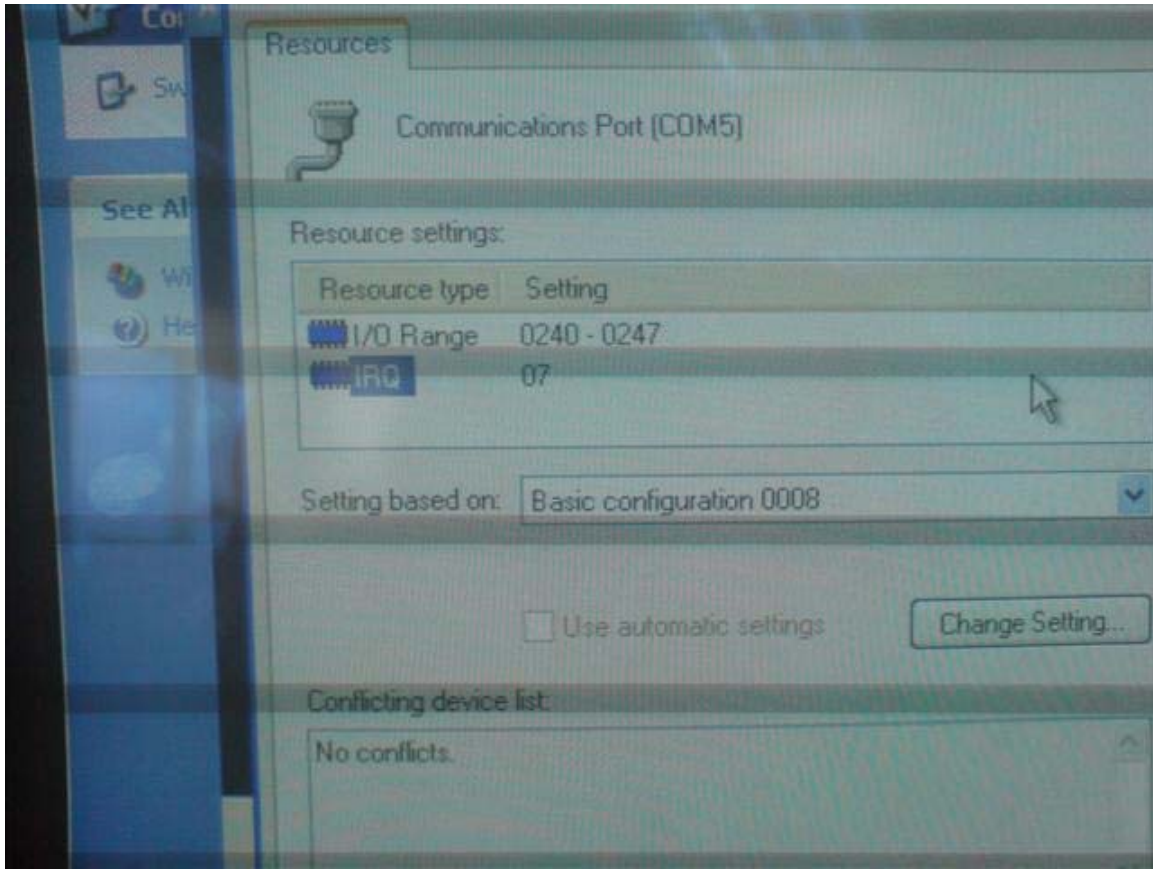
COM2: 0248h-024Fh

COM3: 0250h-0257h

COM4: 0258h-025Fh



Double click on IRQ and select the IRQ set with the jumpers.



This will be the result. Repeat this process for all serial ports and reboot. All should work perfect.



## PCM-3664

### PC104 Configuration

I set the device to Jumper mode. Other options are PNP or Jumperless mode. Both those options are not possible if you use it with the pcm-9375.

I set the device to use IO 300h-31Fh (32bytes) and to work with IRQ 5.

### BIOS Configuration



I reserved 32bytes with base address 300h for the ISA bus.

Phoenix - AwardBIOS CMOS Setup Utility  
IRQ Resources

IRQ	assigned to		Item
IRQ-3	assigned to	[PCI Device]	
IRQ-4	assigned to	[PCI Device]	
IRQ-5	assigned to	[Reserved]	Menu Level
IRQ-7	assigned to	[PCI Device]	
IRQ-9	assigned to	[PCI Device]	Legacy ISA
IRQ-10	assigned to	[PCI Device]	compliant w
IRQ-11	assigned to	[PCI Device]	original PC
IRQ-15	assigned to	[PCI Device]	specificati
			PnP for dev
			compliant w
			Plug and Pl
			whether des
			PCI or ISA
			architectur

I set IRQ 5 to reserved so it is reserved for ISA purposes only.

## OS Device Installation



I had to manually install this driver and because XP expects the RTL8019 always to be PNP it was a bit difficult to find a proper .inf file for the Legacy mode driver.

After this I could successfully install and use the PCM-3664 in XP with the PCM-9375.

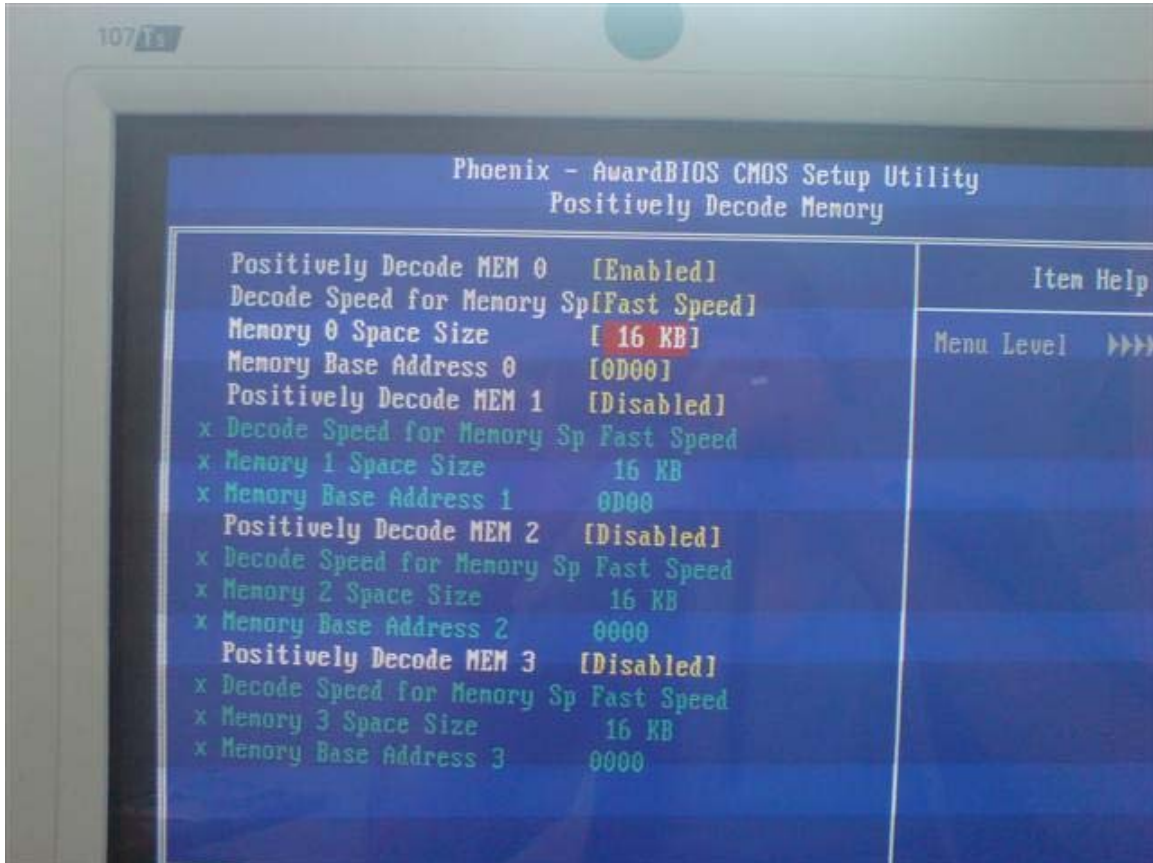
## ***IXXAT PC104 CAN***

### **PC104 Configuration**

The device needs a Memory space of 16Kbyte. This Memory space base address is D0000h. The card is set to use IRQ 5.

### **BIOS Configuration**

Because this card uses a Memory address and not an IO address you need to set the bios as followed:



The Base Address is set to 0D00 this is something to be careful with since the Memory base address is D0000 but in the bios it should be set as 0D00.

Phoenix - AwardBIOS CMOS Setup Utility  
IRQ Resources

IRQ	assigned to	Item
IRQ-3	assigned to	[PCI Device]
IRQ-4	assigned to	[PCI Device]
IRQ-5	assigned to	[Reserved]
IRQ-7	assigned to	[PCI Device]
IRQ-9	assigned to	[PCI Device]
IRQ-10	assigned to	[PCI Device]
IRQ-11	assigned to	[PCI Device]
IRQ-15	assigned to	[PCI Device]

Menu Level  
Legacy ISA  
compliant w  
original PC  
specificati  
PnP for dev  
compliant w  
Plug and Pl  
whether des  
PCI or ISA  
architectur

Set IRQ 5 to reserved so it is reserved for ISA purposes only.

## OS Device Installation

I used Linux drivers to test the device, the drivers did not need any modification and detected the CAN card automatically.



## PCM-3680

### PC104 Configuration

I set the base address to default DA00h and IRQ 3 and 4 for channel 1 and 2.

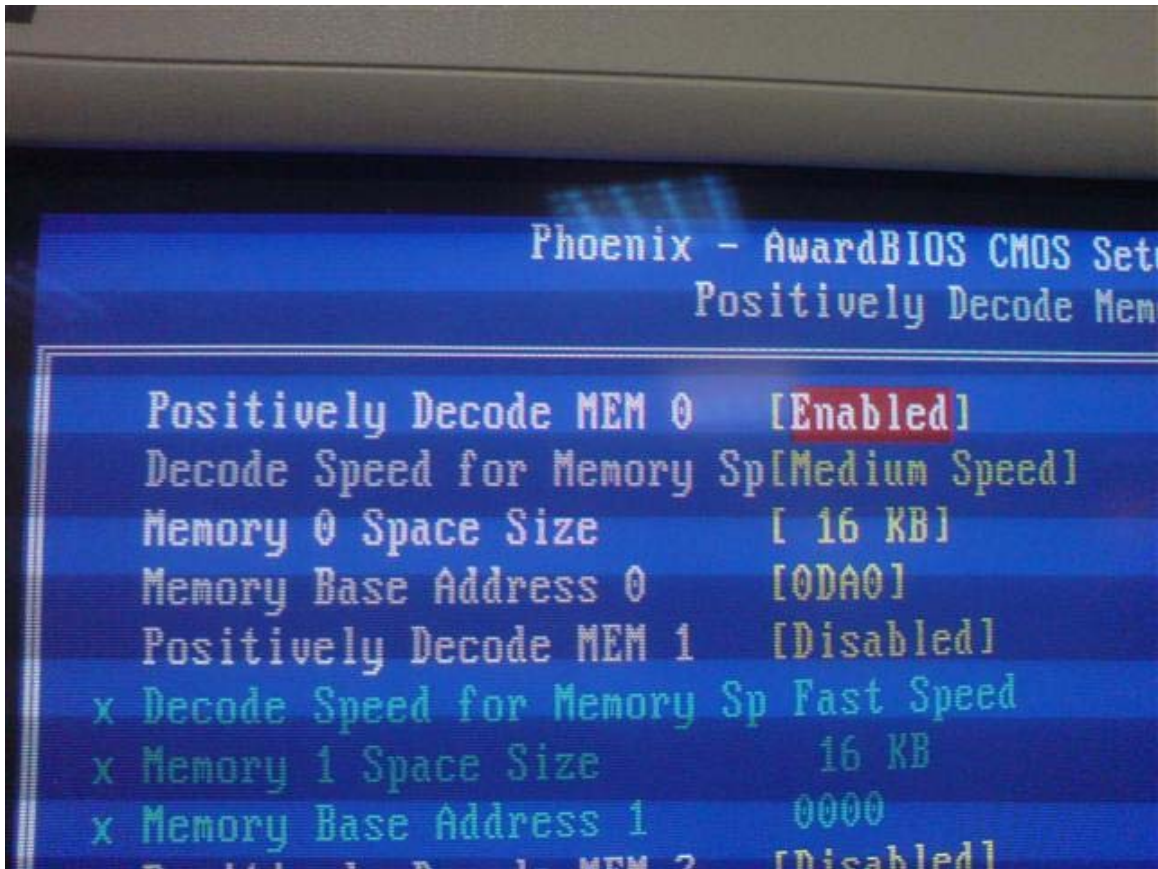
### BIOS Configuration

Because I tested both V1.15 and V1.16 I will show both configurations also here you can see the difference in notation in V1.15 and V1.16.

First I of course disabled COM1 and COM2 to free IRQ 3 and 4. I also disabled all IO address spaces which are allocated by default in the bios.

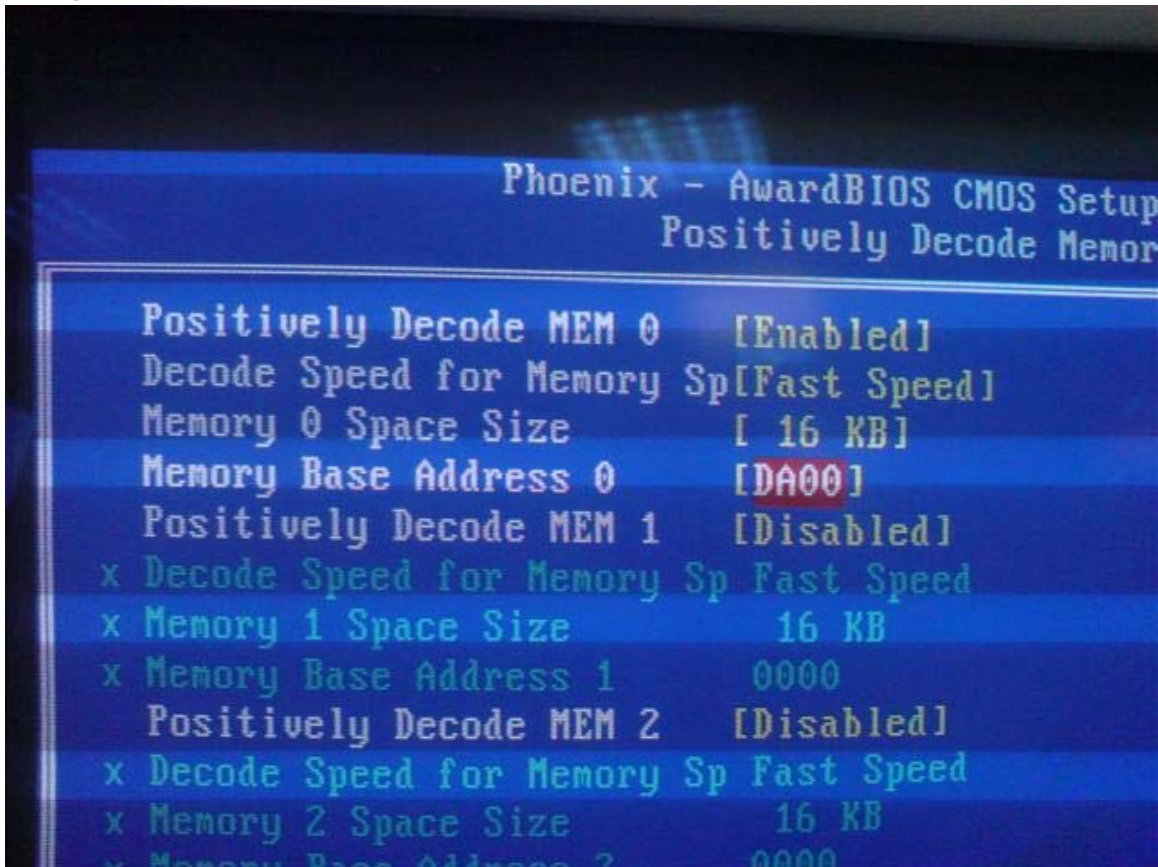


Now you have to set the memory address space which will be allocated for the ISA bus. (two pictures for Bios V1.15 and V1.16.)



You can also select Fast speed of course, but if you notice you run into data loss please try medium or even slow speed.

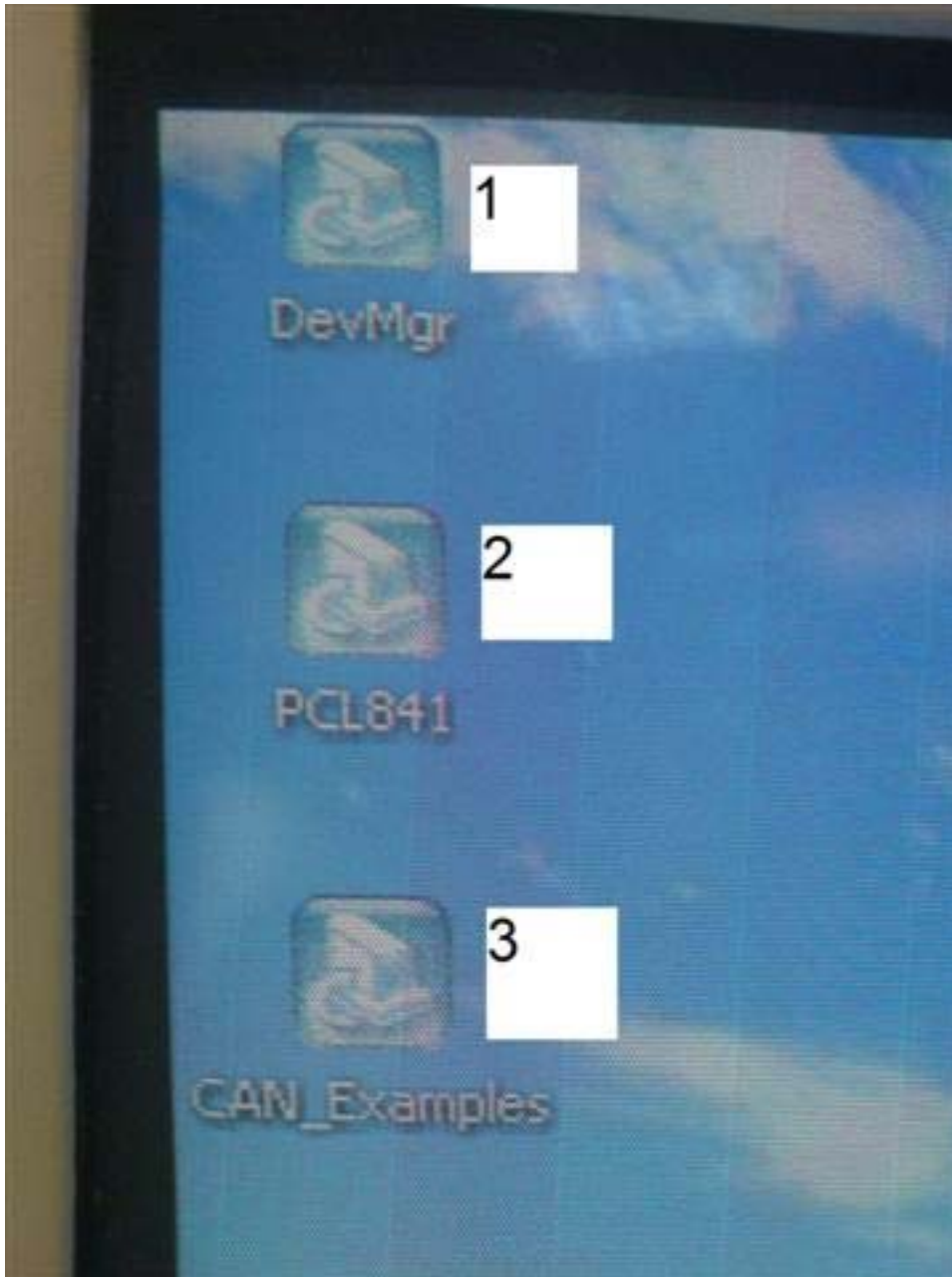




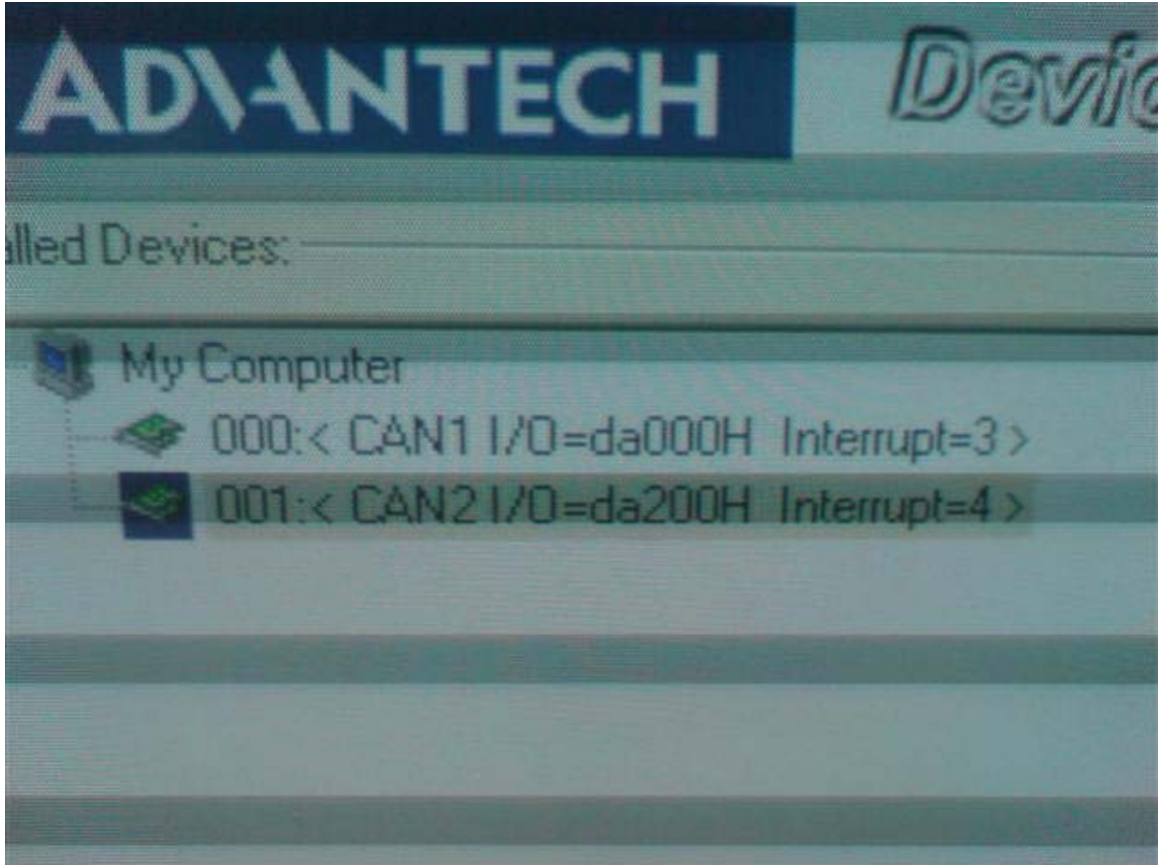
As you can see the notation has changed a little. Also here if you run into any data loss please try to set the decode speed to medium.

## OS Device Installation

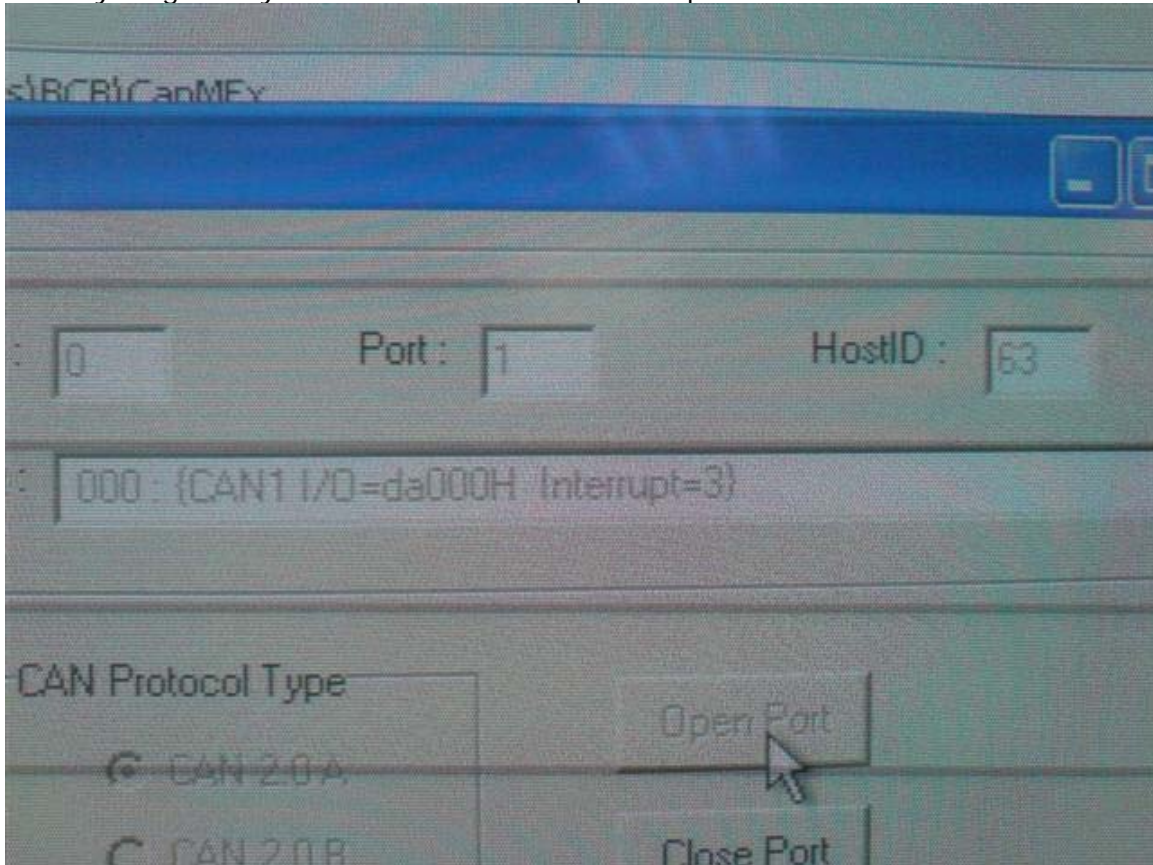
For the OS installation you have to perform a couple of steps. The device will not be installed with the normal procedure but you need to use the Advantech Device manager. Below is the installation order I followed. All these files are on the CD which comes with the device.



After executing all 3 setup files you start the Device manager. Here you can select the CAN card and a menu will be given. This is pretty straight forward; you choose the base address and irq that you selected. Be careful that for the second port you choose the next base address in this situation Port 1 is DA00h and Port 2 is DA20h. The result should be as followed.



Now you can test the example utility. I used the BCB version, you can find it at  
c:\program files\advantech\can\example\bcv\  
If everything is ok you should be able to open the port!



If something is wrong you will receive an error message.