Advantech LX800 and ITE8888 ISA bridge

Revision 1.2

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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:
 - o PCM-3353
 - o PCM-4153
 - o PCM-9375
 - o 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 D0000h 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 (FFFFFh) 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.

Phoenix - AwardBIOS CMOS Setup United Stress Positively Decode I/O [Press Enter] Positively Decode Memory [Press Enter] IT8888 DMA support [Press Enter]	10	3.0
 Positively Decode I/O Positively Decode Memory IT8888 DMA support IPress Enter] 	Phoenix -	AwardBIOS CMOS Setup L ITE8888 Configure
	 Positively Decode I/O Positively Decode Memory IT8888 DMA support 	[Press Enter] [Press Enter] [Press Enter]

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.

5	Intel PCIC compatible PCMCIA controller
	Reso ce settings:
ac	Resource type Setting
ek ek :ek	I/O Range 03E0 - 03E1 Memory Range 000D0000 - 000D0FFF Memory Range 000DF000 - 000DFFFF
rta ime	Setting based on: Current configuration
	Use automatic settings Change

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 16byes 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.

The PCMIA 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 PCMIA disk in the slot it will install a PCMIA 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 PCMIA PC104 module on a different type of board also check the PCMIA device(s) you will use!



PCMCIA ID	E/ATAPI Controller
Resource settings:	
Resource type S IRQ 0 IIRQ F	Setting 7 FFO - FFFF
Getting based on	Surrent configuration

PCM-3643

PC104 Configuration

I set the device to share IRQ 7for all serial ports. The base address of the serial ports was set to 240h-25Fh (total 32byes 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:

Phoenix - AwardBIOS CMOS Setu Positively Decode I/O

Positively Decode 1/0 0 [Enabled] Decode Speed for IO Space [Medium Speed] [8 byte] 10 Space 0 Size: 1/0 base address 0 [15:7]:[0240] Positively Decode I/O 1 [Enabled] Decode Speed for IO Space [Medium Speed] [8 byte] IO Space 1 Size: I/O base address 1 [15:7]:[0248] Positively Decode I/O 2 [Enabled] Decode Speed for IO Space [Medium Speed] [8 byte] 10 Space 2 Size: 1/0 base address 2 [15:7]:[0250] Positively Decode I/O 3 [Enabled] Decode Speed for IO Space [Medium Speed] [8 byte] 10 Space 3 Size: I/O base address 3 [15:7]:[0258] Positively Decode I/O 4 [Disabled] 16 bute

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

	Phoenix -	- AwardBIOS CMOS Setur IRQ Resources) Ut
IRQ-3 assigned	to	[PCI Device]	
IRQ-4 assigned	to	[PCI Device]	
IRQ-5 assigned	to	[PCI Device]	
IRQ-7 assigned	to	[Reserved]	
IRQ-9 assigned	to	[PCI Device]	
IRQ-10 assigned	to	[PCI Device]	
IRQ-11 assigned	to	[PCI Device]	
IRQ-15 assigned	to	[PCI Device]	
Manual Street, and Street, and			
			P
			U
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and the second second second			đr

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

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

ol Pan	el							
anel		8	Č Accessibility	Add Hardware	Add or	Administrative	Automatic	Date
	Add Ha	rdware	Wizard					
	Is th	e hardw	vare connect	ed?				3
Upda								S.
Supp								
		Have you	already conne	cted this hardware	to your comp	puter?		
Sec.		•Ye:	s, I have alread	y connected the h	ardware			
		O No	, I have not add	ded the hardware j	yet.			
12	-							
	1500							
	100000							

Select Yes and click next.



Select Add a new hardware device and click Next.

wizard	can	help	vou	insta	dl ot	her	hard	Hare
			-	CONTRACTOR OF THE	1000	TATION AND	CO.	

The wizard can search for other hardware and automatically install it for you. Or, know exactly which hardware model you want to install, you can select it from a What do you want the wizard to do? O Search for and install the hardware automatically (Recommended) The hardware that I manually select from a list (Advanced)

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



Select Ports (COM&LPT) and click Next



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

214	The wizard is ready to install your hardware
Al Wi He	Hardware to install:
	To start installing your new hardware, click Next
	< Back Nrgt> Cancel

Click Next



Click Set Configuration Manually.

Resource settings:				
Resource time	Setting		1 1 1 1 1 1 1	
BLO Rance	03E8 . 03EE	*******	11111	
WIN IRQ	04		p not	
		NUSSEE D	1 6 1 1 1 1	
	a della d	A CONTRACTOR OF THE OWNER OF THE	e and	
Setting based on:	Basic configuration 0000	4	34)	
	Basic configuration 0000	The second second	Sec.	
	Basic configuration 0001	CONTRACTOR IN	T NORTHEAST	
	Basic configuration 0003	1112510	1 TOLAL	
Conflicting device	Basic configuration 0004	25381861	ed	
Carrierigueater	Basic configuration 0005	CONTRACTOR OF	D STATISTICS	
Input/Output Rang	Basic configuration 0007			
Communication in the	Basic configuration 0008		1 - Carrieland	
	ng.		Cannal	
			Land	

Select Basic configuration 0008.

			<u>?</u> ×	(Ba 1	
Resources			111	Wizard	ac s
J Communication	Edit Inpu	ut/Output Range		<u>?</u> ×	
Resource settings:	Enter the	input/output range you	a would like to set fo	this device.	d
Resource type Sett	You may will be au up and d	either enter a specific r tromatically selected, or lown arrows.	ange and the neare you may select a ra	st valid range inge using the	
Setting based on: Bas	This reso	purce is assigned to the	following child devi	ce(s)	
	Value:	0100 - 0107			L
Conflicting device list No conflicts	Conflic The s device No d	st information atting you have choser es. levices are conflicting.	n does not conflict w	ith any other	

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

Communic Resource settings:	cations Port (COM5)	Enter the interrupt request you wo You may either enter a specific va will be automatically selected, or yo up and down arrows		
Resource type	Setting 0240 - 0247 ?	This res	ource is assigned to the follow	
Setting based on:	Basic configuration (Value:	03	
	Prase configuration of	Conflict information Windows cannot determine if the conflicts with another device		
	Use automatic se	Unkr	nown	
Conflicting device	fist			
No conflicts.				
	The second s			

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.

				0	1
1			Phoenix	- AwardBIOS CMOS Set IRQ Resources	tup Utility
Г	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]	Legacy
	IRQ-10	assigned	to	[PCI Device]	
	IRQ-11	assigned	to	[PC1 Device]	
	IRQ-15	assigned	to	[PCI Device]	PnP for
					complia
					whether
					PCI or
					archite

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

Realtek RTL8019	LAN adapter or compatible (Legacy ??
General Driver	Details Resources
Realtek F	RTL8019 LAN adapter or compatible (Legacy Mode)
Resource settings:	
Resource type	Setting
IRQ	05
I/O Range	0300 - 031F
Setting based on:	Current configuration

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.

9				0	
r			Phoenix	- AwardBIOS CMOS Set IRQ Resources	ap Utility
Г	IRQ-3	assigned	to	[PCI Device]	
	IRQ-4	assigned	to	LPCI Device]	Manu Ta
	IRQ-5	assigned	to	[Keserved]	
	IRQ-7	assigned	to	LPCI DeviceJ	Legaru
	IRQ-9	assigned	to	IFCI Devicel	
	IRQ-10	assigned	to	LFCI Devicel	
	IRQ-11	assigned	to	IFCI Devices	specifi
	IRQ-15	assigned	to	LICI DEVICED	PnP for
					complia
					whether
					PCI or
					archite

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

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



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.

Phoenix - AwardBIOS CM	OS Set			
Positively Dec	ode I/			
Positively Decode LaD 0 (Disting)				
Pecode Sneed For 10 Sneet Fisher				
x III Space 0 Size: 128 bute				
y L/D hase address 0 [15:41: 0200				
Positively Decode 1/0 1 [Disabled]				
y Decode Sneed for 10 Snace Fast Sneed				
x 10 Space 1 Size: 16 bute				
x 1/0 base address 1 [15:4]: 0300				
Positively Decode 1/0 2 [Disabled]				
x Decode Speed for 10 Space Fast Speed				
x 10 Space 2 Size: 128 byte				
x 1/0 base address 2 [15:4]: 0800				
Positively Decode I/0 3 [Disabled]				
x Decode Speed for 10 Space Fast Speed				
x 10 Space 3 Size: 64 byte				
x I/O base address 3 [15:4]: 0200				
Positively Decode 1/0 4 (Disableur)				
x Decode Speed for 10 Space Tast spite				
x 10 Space 4 Size:	-			
Aton Mouse Enter: Select +/-/PU/PD:Value	F10:			
Tat Unde Furch rooters	17			

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.



Phoenix - AwardBIDS CMOS Setur
Positivelu Decode Monor
Leororoug becoue nemor
Positively Decode MEM 0 [Enabled]
Decode Speed for Memory Sn[Fast Speed]
Memoru O Snace Size [16 VB]
Memory Base Address A [DAG0]
Positively Decode MFM 1 [Disabled]
Y Decode Speed for Memory Sn Fact Speed
x Memory 1 Succe Size 16 VB
x henory 1 space size 10 KD
A HEADLY BASE HAAPESS 1 0000
rositively Decode MEM Z [Disabled]
x Decode Speed for Memory Sp Fast Speed
x Memory 2 Space Size 16 KB

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.

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\bcb\ If everything is ok you should be able to open the port!

siBCBiCanMEY Port : HostID : : {CAN1 I/O=da000H Interrupt=3} CAN Protocol Type to de la sector de la sector Close

If something is wrong you will receive an error message.