
Subject: computer card/slot confusion

Posted by [steve f](#) on Thu, 17 Nov 2005 12:32:24 GMT

[View Forum Message](#) <> [Reply to Message](#)

Hi Everyone,I started this topic in the general forum. Wayne asked me to bring it here. I want to use a LMS card (Linear X) in a "modern" computer. Here's the problem. The card requires the use of an ISA slot. Computers don't have them anymore. Solutions and suggestions please.Steve

Subject: LMS ISA card compatibility

Posted by [Wayne Parham](#) on Thu, 17 Nov 2005 17:28:24 GMT

[View Forum Message](#) <> [Reply to Message](#)

I told you I was going to do some research and report my findings under your thread. I intend to do that this week; Sorry, I haven't done it yet. But I will. There are two ways you can go besides using the LinearX supplied converter chassis. One is to use a full-sized motherboard to build a PC. Another is to use industrial control modules. I've used several of those for various projects, and they're essentially just rugged and often miniaturized PC boards. You'll still need a full sized chassis because the LMS takes a full-length slot. But my point is there are other options besides traditional PC motherboards. Please note that there is more involved than just finding a PC with an ISA slot. The LMS card is incompatible with some slots. My guess is that it needs buss speed to be the same as the old original 4.77Mhz IBM PC. Newer computers often ran the buss faster, and occasionally, some ISA cards wouldn't work with the faster buss speed. So you have to test for electrical compatibility as well as physical compatibility.

Subject: Re: LMS ISA card compatibility

Posted by [steve f](#) on Thu, 17 Nov 2005 17:40:57 GMT

[View Forum Message](#) <> [Reply to Message](#)

Thank you Wayne.

Subject: Re: LMS ISA card compatibility

Posted by [Wayne Parham](#) on Thu, 17 Nov 2005 21:04:25 GMT

[View Forum Message](#) <> [Reply to Message](#)

I just got off the phone with Chris at LinearX. I'm glad I spoke to him, because after seeing two of David Lee's computers not work with LMS, I suspected the LMS card may be sensitive to buss

timing or something. But Chris tells me that he has never run across a system with an ISA buss that wouldn't work with the LMS card. I have seen some boards not work in ISA slots. I did a little checking to refresh my memory, and the original standard ran the buss at 8.3Mhz and (naturally) had specific timing requirements for setup and hold of each signal line. Some cards are intolerant of deviation from these specs, so as later manufacturers started superceding it, those cards would not work. But the position of LinearX is that the LMS board is compatible with any motherboard that has an ISA slot.

Subject: Re: LMS ISA card compatibility
Posted by [steve f](#) on Thu, 17 Nov 2005 22:45:27 GMT
[View Forum Message](#) <> [Reply to Message](#)

Our card is an early one I believe. We bought it at a lower price when a later card was introduced.

Subject: Re: LMS ISA card compatibility
Posted by [Wayne Parham](#) on Fri, 18 Nov 2005 14:52:55 GMT
[View Forum Message](#) <> [Reply to Message](#)

The early cards were slightly different, but I don't know specifics. I was focused on the new cards since I assumed that's what everyone was running. You might want to call Chris at LinearX to learn the specifics of earlier release boards.

Subject: Re: computer card/slot confusion
Posted by [yehuda](#) on Sun, 20 Nov 2005 14:45:45 GMT
[View Forum Message](#) <> [Reply to Message](#)

Hi, I have a SOYO pentium 4 board with an ISA slot. Check on their web site. <http://www.soyousa.com/products/proddesc.php?id=335> Yehuda.

Subject: Re: computer card/slot confusion
Posted by [compGuy](#) on Tue, 30 Nov 2010 01:55:15 GMT
[View Forum Message](#) <> [Reply to Message](#)

You may also want to try and find a daughter card that will plug into a PCI slot that will give you

ISA. I don't know of any off hand, but I have used them in the past before I upgraded my video card to PCI. It should work the same with the sound card.

Subject: Re: LMS ISA card compatibility
Posted by [Adveser](#) on Tue, 30 Nov 2010 14:39:44 GMT
[View Forum Message](#) <> [Reply to Message](#)

Wayne Parham wrote on Thu, 17 November 2005 11:28
I told you I was going to do some research and report my findings under your thread. I intend to do that this week; Sorry, I haven't done it yet. But I will.

There are two ways you can go besides using the LinearX supplied converter chassis. One is to use a full-sized motherboard to build a PC. Another is to use industrial control modules. I've used several of those for various projects, and they're essentially just rugged and often miniaturized PC boards. You'll still need a full sized chassis because the LMS takes a full-length slot. But my point is there are other options besides traditional PC motherboards.

Please note that there is more involved than just finding a PC with an ISA slot. The LMS card is incompatible with some slots. My guess is that it needs buss speed to be the same as the old original 4.77Mhz IBM PC. Newer computers often ran the buss faster, and occasionally, some ISA cards wouldn't work with the faster buss speed. So you have to test for electrical compatibility as well as physical compatibility.

Wayne, this is why us Computer Electronics guys slow down the PLL chip's operating frequency in a computer by various means. It is usually done to overclock the entire computer close to it's electrical tolerance instead of OC the CPU.

I've gotten a 700Mhz Celeron running at 100Mhz Bus up to 1100Mhz with a 166Mhz Bus. Slowing down is much easier than speeding up. It's a time consuming task to get something that works, but it can be done.

Subject: Re: LMS ISA card compatibility
Posted by [Wayne Parham](#) on Tue, 30 Nov 2010 19:11:35 GMT
[View Forum Message](#) <> [Reply to Message](#)

Yes, but this is really an ISA buss timing issue, not a local buss or processor thing. Most of my career has been designing microprocessor-driven industrial controllers, and back in the days when the PC used the ISA buss, I designed several controllers that plugged into it.

Early microcontrollers made no distinction between local buss and processor buss - everything was on the same buss, nothing but switching logic and a single clock. Examples are the S100 buss and the ISA buss, as well as countless other proprietary busses that were essentially just connections to the microprocessor's address and data busses.

Add-on cards in early microprocessor systems sometimes had problems, especially if the processor was run at faster speeds. It wasn't long before the processor and buss were separated using newer buss architectures so you could run processor and local memory at high speed and slower peripherals could be run on an interface at their own speed. But the early ones weren't as sophisticated, and everything ran at the speed of processor clock.

Subject: Re: LMS ISA card compatibility
Posted by [Adveser](#) on Tue, 30 Nov 2010 21:36:20 GMT
[View Forum Message](#) <> [Reply to Message](#)

Wayne Parham wrote on Tue, 30 November 2010 13:11

Yes, but this is really an ISA buss timing issue, not a local buss or processor thing. Most of my career has been designing microprocessor-driven industrial controllers, and back in the days when the PC used the ISA buss, I designed several controllers that plugged into it.

Early microcontrollers made no distinction between local buss and processor buss - everything was on the same buss, nothing but switching logic and a single clock. Examples are the S100 buss and the ISA buss, as well as countless other proprietary busses that were essentially just connections to the microprocessor's address and data busses.

Add-on cards in early microprocessor systems sometimes had problems, especially if the processor was run at faster speeds. It wasn't long before the processor and buss were separated using newer buss architectures so you could run processor and local memory at high speed and slower peripherals could be run on an interface at their own speed. But the early ones weren't as sophisticated, and everything ran at the speed of processor clock.

That is interesting. Every time I used the software it was controlling the ISA bus too. The PLL chip is the master clock and I think every component in the computer has to use this clock as a master. Everything on the motherboard bus was affected in the case of a 2009 Sony Vaio and a 2000 Toshiba at least.

The sound card would not work for example if the Clock was set too high.

I'm sure things can be very different on a Tower than a LT though.

This is something one should only have to mess with if they have a laptop and a locked bios in any event.

Subject: Re: LMS ISA card compatibility
Posted by [Wayne Parham](#) on Wed, 01 Dec 2010 01:04:36 GMT

This is the technical manual for the old original IBM PC. Schematics start on page 465. Page 475 shows the ISA connectors. Data buss, address buss, clock, hardware IRQ lines, etc. Pretty basic stuff, bare bones.

IBM PC Technical Reference Manual still have one of those old manuals around here somewhere. Old tech sheets make me kind of sentimental, I guess that makes me a real geek.

I have a lot of 1970's computer magazines too, mostly about 6502 processors like the Apple II used. Back then, the magazines were mostly about hardware and showed schematics. Software was usually little snippets of machine code, or sometimes stuff written in 8K BASIC.