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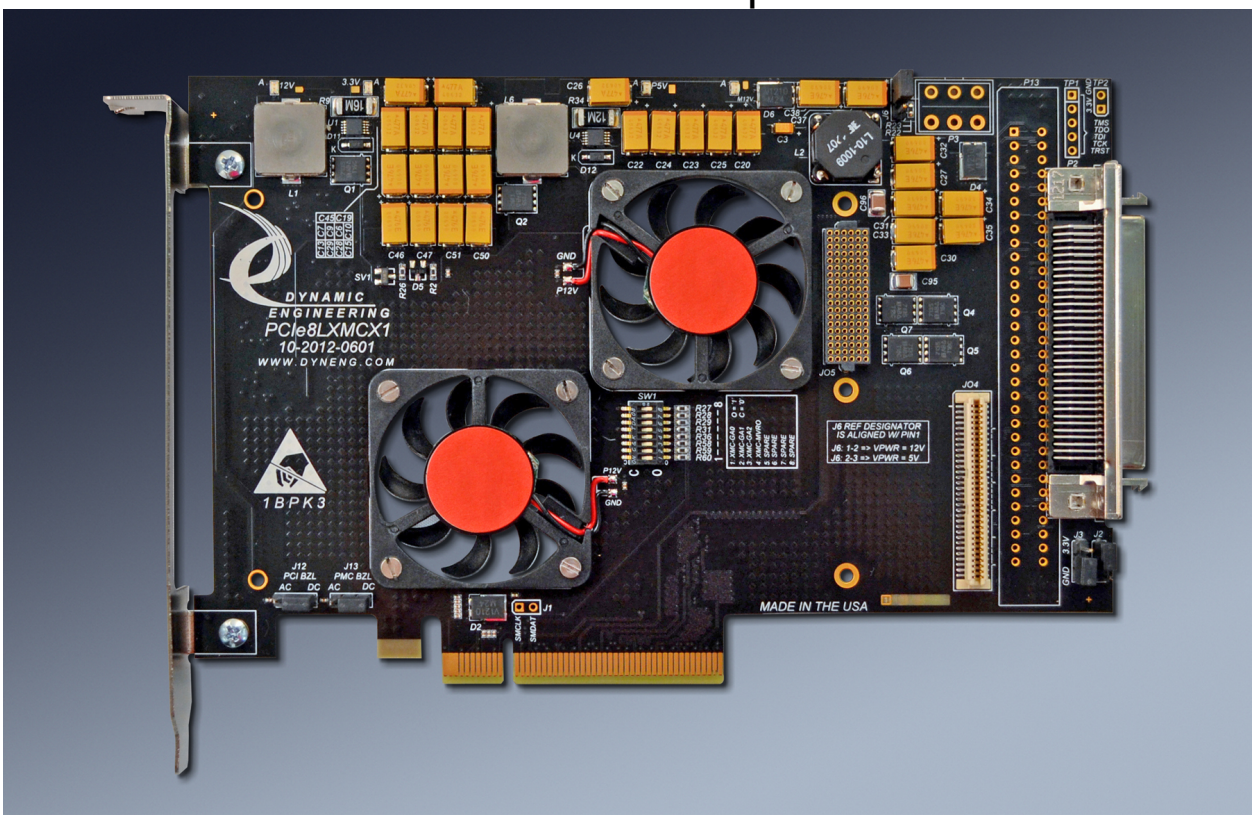
User Manual

PCIe8LXMCX1
PCIe4LXMCX1

PCIe 4/8 Lane XMC Compatible Carrier



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PCIe(4/8)LXMCX1
PCIe and XMC Compatible Carrier

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Dynamic Engineering has made every effort to ensure that this manual is accurate and complete. Still, the company reserves the right to make improvements or changes in the product described in this document at any time and without notice. Furthermore, Dynamic Engineering assumes no liability arising out of the application or use of the device described herein.

The electronic equipment described herein generates, uses, and can radiate radio frequency energy. Operation of this equipment in a residential area is likely to cause radio interference, in which case the user, at his own expense, will be required to take whatever measures may be required to correct the interference.

Dynamic Engineering's products are not authorized for use as critical components in life support devices or systems without the express written approval of the president of Dynamic Engineering.

Connection of incompatible hardware is likely to cause serious damage.

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Product Description

PCIe8LXMCX1 and PCIe4LXMCX1 are part of the Dynamic Engineering PCIe and XMC Compatible family of modular I/O components. Both adapt an XMC to one PCIe slot. [PCIeNLXMCX1 where N=4,8]

The PC is still a frequent host to embedded HW for development, and delivery. With the PCIe bus overtaking PCI, XMC's and PC's with PCIe are becoming common. Use PCIe8LXMCX1 to install your XMC in a PC using an x8 and larger PCIe connector. PCIe4LXMCX1 can be used in x4 and larger positions.

Special features:

- Passive 4/8 lane Gen1/2/3 design
- Voltage monitors, each with LED's on plus 12V, minus 12V, plus 5V, plus 3.3V
- 10A regulator for XMC 3.3V and 5V supplies 4L model
- 15A regulator for XMC 3.3V and 5V supplies 8L model rev 06 and later
- Selection switch for VPWR [12V or 5V]. Option for hardwired 5V or 12V
- Front panel connector access through PCI bracket
- User IO [Pn4] available through one of two cable connectors (DIN IDC or SCSI II compatible) Spare pins on SCSI connector can be shunt selected to power or ground.
- Cooling cutout for increased airflow to XMC's
- Optional Fan(s) for increased airflow
- JTAG programming support
- DIP switch to select global addressing on XMC's

The PCIeNLXMCX1 is ready to use with the default settings. Just install the XMC onto the PCIeNLXMCX1 and then into the system.

Headers and TestPoints

J6 is used to select the VPWR source for position 0 and 1 respectively. When the Shunt closes 1-2 – 12V is selected. With 2-3 closed 5V is selected. FET's are used to provide a low impedance path from the power supplies to VPWR for each position. Options are in place on the PCB to allow hardwired selections for clients who prefer a fixed voltage. The headers are not installed when the fixed voltage option is in place. With pin 2 open VPWR will be open.

J12, 13, are used to select the bezel grounding option. 1-2 selects AC coupled, 2-3 selects DC coupled and open is open. J13 = PCIe Bezel. J12 = XMC bezel.

J1 is an optional header for SMB connection. Pin 1 is data and pin 2 is clock. Both are pulled up. 3rd party tools can be used to see the "innards" of the XMC if the bus is in use. Usually not needed but handy if you are doing development.

TP1, TP2 are optional JTAG header/pwr used to connect to the XMC. .025" sq post header. The pin definitions are in the silk. 1: 3.3V, 2: GND, 1: TMS, 2: TDO, 3: TDI, 4: TCK, 5: TRST

J2 controls the voltage on 33,67 of P2 when the SCSI connector options are selected. 1-2 selects 3.3V and 2-3 selects ground on those pins. The shunt and traces are rated for 1A. Not fuse protected.

J3 controls the voltage on 34,68 of P2 when the SCSI connector options are selected. 1-2 selects 3.3V and 2-3 selects ground on those pins. The shunt and traces are rated for 1A. Not fuse protected.

J4, J5 control the power sequencing for 3.3V and 5V respectively. 1-2 selects a delayed start-up of the power supply, 2-3 for immediate start-up [based on 12V available] and open is off [used for power savings when a supply is not required. Added with Rev 03 8L boards, Rev01 for 4L version. Resistor options are available to hardwire the selection.

P3 is an optional power connector to allow for added 12V power to be used by the PCIeNLXMCX1. The PCIe gold fingers allow for about 60W of power to be consumed by the board across all XMC voltages including power supply losses. In many cases the power budget is more than sufficient. If your XMC requires more power please request the optional power connectors [2x3 PC power cable common with current PC Power supplies] to increase the 12V available. Both 12V entry points are diode coupled to prevent the current back-feeding when an external or other supply is added.

P3: 1-3 = +12, 4-6 = GND.

DipSwitch Settings

Switch 1: Global Address Settings

Position 1-3 corresponds to XMC GA0-2. When closed the signal is '0'. When open the signal is '1'.

Position 4 corresponds to XMC-MVR0. When closed the signal is '0'. When open the signal is '1'.

Position 5-8 are spare

Options

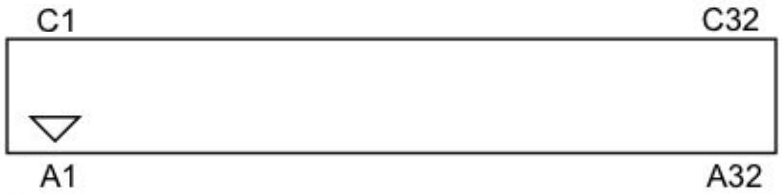
Dynamic Engineering offers multiple versions of the PCIeNLXMCX1design.

In addition to the basic passive design there are options for Ethernet, Fan, Serial ports, and minimization.

The PCIeNLXMCX1 features cooling cutouts designed to support the addition of a fan in one or two positions for each XMC. On PrXMC's and other XMC's with high thermal loads the fan option is a good idea. On cards with a lower thermal profile the fan is not needed. The fan produces 5 CFM in a small area to create a high LFM rating suitable for most cooling requirements. The fan used has a relatively low noise rating for quiet operation. Position 1 is closest to the PCI bezel and position 2 is closer to the XMC connectors.

In addition the PCIeNLXMCX1 has two options for Pn4 signal routing. VME style 2x32 pin header [shown] or a SCSI style connector.

Please mix and match options, as you need them.



The “VME” connectors are oriented as shown in the photo on the cover, and the diagram. The square pad in the photo is “A1”. The mating part number is 120-964-455 Panduit, DIN-IDCA-64CSB-TG30 Robinson Nugent, Berg also has a part which is slightly taller.

Cables and breakouts are available from Dynamic Engineering – Please see DINterm64 and DINribn64 or HDEcabl68 and HDEterm68 products from the Dynamic Engineering website.

XMC Module Backplane IO Interface Pin Assignment

The figure below gives the pin assignments for the XMC Module IO Interface – from Jn4 to the PCIeNLXMCX1connectors. Also see the User Manual for your XMC board for more information. Please note that P2 or P3, P4 or P5 are installed not both.

DIN IDC [P13]		SCSI II [P2]			Jn4		Jn6	
A1	C1	1	35		3	1	B1	A1
A2	C2	2	36		4	2	E1	D1
A3	C3	3	37		7	5	C2	C1
A4	C4	4	38		8	6	F2	F1
A5	C5	5	39		11	9	B3	A3
A6	C6	6	40		12	10	E3	D3
A7	C7	7	41		15	13	C4	C3
A8	C8	8	42		16	14	F4	F3
A9	C9	9	43		19	17	B5	A5
A10	C10	10	44		20	18	E5	D5
A11	C11	11	45		23	21	C6	C5
A12	C12	12	46		24	22	F6	F5
A13	C13	13	47		27	25	B7	A7
A14	C14	14	48		28	26	E7	D7
A15	C15	15	49		31	29	C8	C7
A16	C16	16	50		32	30	F8	F7
A17	C17	17	51		35	33	B9	A9
A18	C18	18	52		36	34	E9	D9
A19	C19	19	53		39	37	C10	C9
A20	C20	20	54		40	38	F10	F9
A21	C21	21	55		43	41	B11	A11
A22	C22	22	56		44	42	E11	D11
A23	C23	23	57		47	45	C12	C11
A24	C24	24	58		48	46	F12	F11
A25	C25	25	59		51	49	B13	A13
A26	C26	26	60		52	50	E13	D13
A27	C27	27	61		55	53	B15	A15
A28	C28	28	62		56	54	E15	D15
A29	C29	29	63		59	57	B17	A17
A30	C30	30	64		60	58	E17	D17
A31	C31	31	65		63	61	B19	A19
A32	C32	32	66		64	62	E19	D19
		33	67	Open, +3 or GND via J2,19 silk screen defined				
		34	68	Open, +3 or GND via J3,20				

FIGURE 1 PCIENLXMCX1 PN4/JN6 INTERFACE STANDARD

Read table:
P13-C1 = P2-35 = Pn4-1
P13-A1 = P2-1 = Pn4-3
etc.

Applications Guide

Interfacing

Some general interfacing guidelines are presented below. Do not hesitate to contact the factory if you need more assistance.

Installation
The XMC is mounted to the PCIeNLXMCX1 prior to installation within the chassis. For best results: with the PCIe bracket installed, install the XMC at an angle so that the XMC front panel bezel penetrates the PCIe bracket then rotate down to mate with the XMC [PnX] connectors.

There are four mounting locations per XMC. Two into the XMC mounting bezel, and two for the standoffs near the XMC bus connectors.

Start-up
Make sure that the "system" can see your hardware before trying to access it. Many BIOS will display the PCIe devices found at boot up on a "splash screen" with the VendorID and CardId for the XMC installed and an interrupt level. If the information is not available from the BIOS then a third party PCI device cataloging tool will be helpful

Watch the system grounds. All electrically connected equipment should have a fail-safe common ground that is large enough to handle all current loads without affecting noise immunity. Power supplies and power consuming loads should all have their own ground wires back to a common point.

Power all system power supplies from one switch. Connecting external voltage to the PCIeNLXMCX1 when it is not powered can damage it, as well as the rest of the host system. This problem may be avoided by turning all power supplies on and off at the same time. This applies more to the XMC's installed onto the PCIeNLXMCX1 than the PCIeNLXMCX1 itself, and it is smart system design when it can be achieved.

Construction and Reliability

The PCIeNLXMCX1 is constructed out of 0.062 inch thick high temp RoHS compliant FR4 material. Cooling cutouts have been designed into the product for improved air flow to the XMC sites. The components on the PCIeNLXMCX1 are tied into the internal power planes to spead the dissipated heat out over a larger area. This is an effective cooling technique in the situation where a large portion of the board has little or no power dissipation.

A fan option is available for high thermal load XMCs or for a chassis with a lack of air circulation.

Surface mounted components are used. The connectors are SMT for the XMC bus and through hole for the IO.

The XMC Module connectors are keyed and shrouded with Gold plated pins on both plugs and receptacles. They are rated at 1 Amp per pin, 100 insertion cycles minimum. These connectors make consistent, correct insertion easy and reliable.

The XMC Module is secured against the carrier with the XMC connectors. It is recommended, for enhanced security against vibration, that the XMC mounting screws are installed. The screws are supplied with the XMC from the OEM. Dynamic Engineering has screws, standoffs, blank bezels and other XMC hardware available at a reasonable cost if your XMC was not shipped with some of the required attachment hardware or if it has been misplaced.

Thermal Considerations

If the XMC installed has a large heat dissipation; forced air cooling is recommended. The zero slot Fan option can provide plenty of cooling power should your XMC require it.

Warranty and Repair

Please refer to the warranty page on our website for the current warranty offered and options.

http://www.dyneng.com/warranty.html

Service Policy

Before returning a product for repair, verify as well as possible that the suspected unit is at fault. Then call the Customer Service Department for a RETURN MATERIAL AUTHORIZATION (RMA) number. Carefully package the unit, in the original shipping carton if this is available, and ship prepaid and insured with the RMA number clearly written on the outside of the package. Include a return address and the telephone number of a technical contact. For out-of-warranty repairs, a purchase order for repair charges must accompany the return. Dynamic Engineering will not be responsible for damages due to improper packaging of returned items. For service on Dynamic Engineering Products not purchased directly from Dynamic Engineering contact your reseller. Products returned to Dynamic Engineering for repair by other than the original customer will be treated as out-of-warranty.

Out of Warranty Repairs

Out of warranty repairs will be billed on a material and labor basis. Customer approval will be obtained before repairing any item if the repair charges will exceed one half of the quantity one list price for that unit. Return transportation and insurance will be billed as part of the repair and is in addition to the minimum charge.

For Service Contact:

Customer Service Department
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Specifications

Logic Interfaces:	PCIe up to 8 lanes per XMC Gen1 and Gen2 compliant.
Access types:	PCIe TLP transactions. MSI interrupts.
CLK rates supported:	Gen1 – Gen3
Software Interface:	Passive, no SW required for adapter
Initialization:	switch selections for VPWR, bezel grounding, and cable options
Interface:	XMC front bezel via PCIe bracket and User IO connector via DIN ribbon or SCSI II connector
Dimensions:	1/2 length PCIe board.
Construction:	High Temp FR4 Multi-Layer Printed Circuit, Through Hole and Surface Mount Components.

Order Information

standard temperature range -40⇔85ºC

PCIe8LXMCX1	1/2 length PCIe card with XMC position
PCIe4LXMCX1	-FAN(1,2)R [fan installed in position 1 or 2 or both] “R” for rear mounted higher velocity fans(~8 CFM). Non “R” boards use “Zero Slot” fans with ~ 5CFM. -ROHS [ROHS compliant parts and process] -JTAG add JTAG headers -XIO Install Jn6 connectors as well as Jn4 -XIOExc Install Jn6 connectors without Jn4 -VPWR(5/12) use to force VPWR to a voltage -AP use to add alternate PC power conn. 2x3 -5VXXX, -3VXXX where XXX = ND [no delay], DEL[delay], OFF [power supply disabled] for hardwired options instead of user selectable http://www.dyneng.com/PCIe8LXMCX1.html http://www.dyneng.com/PCIe4LXMCX1.html
HDEterm68	http://www.dyneng.com/HDEterm68.html 68 pin SCSI II to 68 screw terminal converter with DIN rail mounting.
HDEcabl68	http://www.dyneng.com/HDEcabl68.html SCSI cables with latch blocks or thumbscrews and various lengths are available. Custom lengths can be ordered.
DINterm64	http://www.dyneng.com/DINterm64.html 64 pin ribbon cable to to 64 screw terminal converter with DIN rail mounting.
DINribn64	http://www.dyneng.com/DINribn64.html 64 pin ribbon cable with strain relief. Add –XX for number of inches. 36” is default.