NPCI-PMC
PCI Carrier for PMC Modules
Technical Reference Manual V1.2
HW Revision 1.1

The NPCI-PMC has been designed by:

N.A.T. GmbH
Kamillenweg 22
D-53757 Sankt Augustin
Phone: ++49/2241/3989-0
Fax: ++49/2241/3989-10

E-Mail: sales@nateurope.com
Internet: http://www.nateurope.com

Disclaimer

The following documentation, compiled by N.A.T. GmbH (henceforth called N.A.T.), represents the current status of the product´s development. The documentation is updated on a regular basis. Any changes which might ensue, including those necessitated by updated specifications, are considered in the latest version of this documentation. N.A.T. is under no obligation to notify any person, organization, or institution of such changes or to make these changes public in any other way.

We must caution you, that this publication could include technical inaccuracies or typographical errors.

N.A.T. offers no warranty, either expressed or implied, for the contents of this documentation or for the product described therein, including but not limited to the warranties of merchantability or the fitness of the product for any specific purpose.

In no event will N.A.T. be liable for any loss of data or for errors in data utilization or processing resulting from the use of this product or the documentation. In particular, N.A.T. will not be responsible for any direct or indirect damages (including lost profits, lost savings, delays or interruptions in the flow of business activities, including but not limited to, special, incidental, consequential, or other similar damages) arising out of the use of or inability to use this product or the associated documentation, even if N.A.T. or any authorized N.A.T. representative has been advised of the possibility of such damages.

The use of registered names, trademarks, etc. in this publication does not imply, even in the absence of a specific statement, that such names are exempt from the relevant protective laws and regulations (patent laws, trade mark laws, etc.) and therefore free for general use. In no case does N.A.T. guarantee that the information given in this documentation is free of such third-party rights.

Neither this documentation nor any part thereof may be copied, translated, or reduced to any electronic medium or machine form without the prior written consent from N.A.T. GmbH.

This product (and the associated documentation) is governed by the N.A.T. General Conditions and Terms of Delivery and Payment.

Note:

The release of the Hardware Manual is related to a certain HW board revision given in the document title. For HW revisions earlier than the one given in the document title please contact N.A.T. for the corresponding older Hardware Manual release.

Table of Contents

List of Tables

List of Figures

1 Introduction

The **NPCI-PMC** is a passive PCI carrier board intended for use with a PMC or PTMC module. It allows the use of standard PMC moules in a standard PC with PCI extension slots. The I/O signals on PMC connector P14 are routed to a VG64 – type connector (rows A – C) on the carrier board.

2 Technical Specifications

2.1 Bus Interface

- PCI interface for PMC modules as defined by IEEE P1386.1 Draft 2.4a, 12.1.2001
- PCI bus 32 bit, 33/66 MHz signals supported
- all 64 I/O signals routed to a VG64 – type connector (rows A – C)
- PCI bus may be completely disabled for stand-alone usage with external power supply

2.2 Power Supply

The NPCI-PMC draws very little power from the supplies. Only a +5V supply is used; +3.3V and +12V/-12V are generated onboard.

2.3 Environment

Temperature:	-40 – +85°C	operating and storage
Humidity:	5 – 90% rh	not condensing

2.4 Statement on Environmental Protection

2.4.1 Compliance to RoHS Directive

Directive 2002/95/EC of the European Comission on the "Restriction of the use of certain Hazardous Substances in Electrical and Electronic Equipment" (RoHS) predicts that all electrical and electronic equipment being put on the European market after June 30th, 2006 must contain lead, mercury, hexavalent chromium, polybrominated biphenyls (PBB) and polybrominated diphenyl ethers (PBDE) and cadmium in maximum concentration values of 0.1% respective 0.01% by weight in homogenous materials only.

As these harzadous substances are currently used with semiconductors, plastics (i.e. semiconductor packages, connectors) and soldering tin any hardware product is affected by the RoHS directive if it does not belong to one of the groups of products exempted from the RoHS directive.

Although many of hardware products of N.A.T. are exempted from the RoHS directive it is a declared policy of N.A.T. to provide all products fully compliant to the RoHS directive as soon as possible. For this purpose since January 31st, 2005 N.A.T. is requesting RoHS compliant deliveries from its suppliers. Special attention and care has been payed to the production cycle, so that whereever and whenever possible RoHS components are used with N.A.T. hardware products already.

2.4.2 Compliance to WEEE Directive

Directive 2002/95/EC of the European Comission on "Waste Electrical and Electronic Equipment" (WEEE) predicts that every manufacturer of electrical and electronical equipment which is put on the European market has to contribute to the reuse, recycling and other forms of recovery of such waste so as to reduce disposal. Moreover this directive refers to the Directive 2002/95/EC of the European Comission on the "Restriction of the use of certain Hazardous Substances in Electrical and Electronic Equipment" (RoHS).

Having its main focus on private persons and households using such electrical and electronic equipment the directive also affects business-to-business relationships. The directive is quite restrictive on how such waste of private persons and households has to be handled by the supplier/manufacturer, however, it allows a greater flexibility in business-to-business relationships. This pays tribute to the fact with industrial use electrical and electronical products are commonly intergrated into larger and more complex envionments or systems that cannot easily be split up again when it comes to their disposal at the end of their life cycles.

As N.A.T. products are solely sold to industrial customers, by special arrangement at time of purchase the customer agreed to take the responsibility for a WEEE compliant disposal of the used N.A.T. product. Moreover, all N.A.T. products are marked according to the directive with a crossed out bin to indicate that these products within the European Community must not be disposed with regular waste.

If you have any questions on the policy of N.A.T. regarding the Directive 2002/95/EC of the European Comission on the "Restriction of the use of certain Hazardous Substances in Electrical and Electronic Equipment" (RoHS) or the Directive 2002/95/EC of the European Comission on "Waste Electrical and Electronic Equipment" (WEEE) please contact N.A.T. by phone or e-mail.

2.4.3 Compliance to CE Directive

Compliance to the CE directive is declared. A ‘CE’ sign can ce found on the PCB.

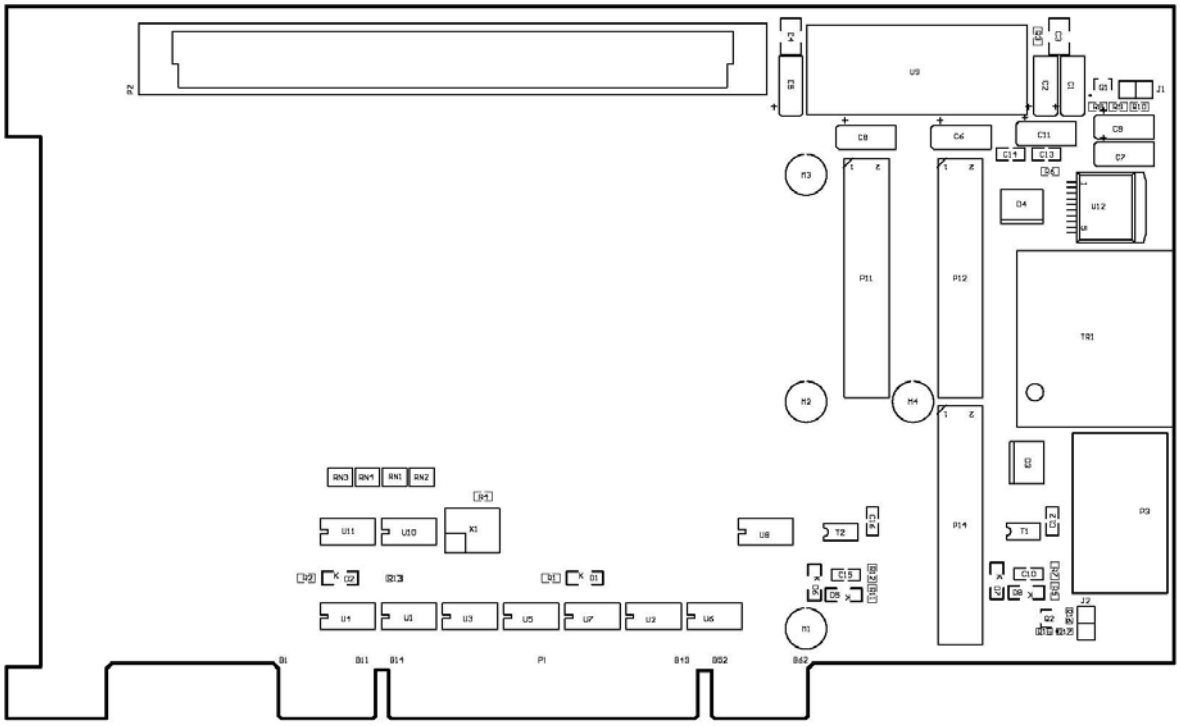
2.4.4 Product Safety

The board complies to EN60950 and UL1950.

3 Hardware Description

This chapter contains a brief description of the functional blocks of the NPCI-PMC PMC extender board.

Figure 1: Location Diagram of the NPCI-PMC



3.1 Hardware Overview

The **NPCI-PMC** is a passive extender board, i.e. it does not contain any circuitry apart from PMC connector set (P11 – P14), the PCIbus signalling voltage adaption to +3.3V, and some power supply circuitry. In addition, there is some circuitry to allow stand-alone applications (i.e. without a PCI bus present, just connected to an external power supply via connector P3).

3.2 PCI Bus Connectivity

If jumper J1 is not installed, PCI connections are active, and the PCI clock is supplied by the carrier board. If jumper J1 is installed, all PCI connections are disconnected, some control lines of the PMC PCI bus are pulled to the correct valid level, and a 33MHz clock is supplied by an onboard oscillator. PCI signals are routed through FET switches, in order to adapt the signalling voltage to +3.3V, the signalling voltage used on the NPCI-PMC to connect the PMC module.

Table 1: PCI Bus Connectivity, Jumper J1

J1	PCI Bus Status
installed	PCI bus isolated
not installed	PCI bus active

Default: J1 not installed, PCI bus active

3.3 Power Supply

If power is taken from the PCI bus or from the power supply connector P3 is defined by the setting of jumper J2.

Table 2: Power Supply, Jumper J2

J2	active Power Connection
installed	power taken from P3 connector
not installed	power taken from PCI bus

Default: J2 not installed, power supply taken from PCI bus

3.3.1 Setting for PCB Version 1.0

On boards with PCB version 1.0 jumper J2 does not exist. The board power source is hard-wired to PCI.

3.4 PCI Bus Connectivity and Power Supply Custom Version

There are custom versions of the NPCI-PMC, where some components (e.g. the FET switches or some power supply circuitry) are not assembled. For these versions power supply and PCI connectivity is hard-wired and cannot be altered by the user!

4 Connectors

4.1 PMC Connectors

Table 3: PMC Connectors P11 and P12

P11				P12			
Pin	**Signal**	**Signal**	**Pin**	**Pin**	**Signal**	**Signal**	**Pin**
1	TCK	-12V	2	1	+12V	TRST#	2
3	Ground	INTA#	4	3	TMS	TDO	4
5	INTB#	INTC#	6	5	TDI	Ground	6
7	NC	+5V	8	7	Ground	PMC-RSVD	8
9	INTD#	PMC-RSVD	10	9	PMC-RSVD	PMC-RSVD	10
11	Ground	NC	12	11	NC	+3.3V	12
13	CLK	Ground	14	13	RST#	NC	14
15	Ground	GNT#	16	15	3.3V	NC	16
17	REQ#	+5V	18	17	PME#	Ground	18
19	V(I/O)	AD[31]	20	19	AD[30]	AD[29]	20
21	AD[28]	AD[27]	22	21	Ground	AD[26]	22
23	AD[25]	Ground	24	23	AD[24]	+3.3V	24
25	Ground	C/BE[3]#	26	25	IDSEL	AD[23]	26
27	AD[22]	AD[21]	28	27	+3.3V	AD[20]	28
29	AD[19]	+5V	30	29	AD[18]	Ground	30
31	V(I/O)	AD[17]	32	31	AD[16]	C/BE[2]#	32
33	FRAME#	Ground	34	33	Ground	PMC-RSVD	34
35	Ground	IRDY#	36	35	TRDY#	+3.3V	36
37	DEVSEL#	+5V	38	37	Ground	STOP#	38
39	Ground	LOCK#	40	39	PERR#	Ground	40
41	PCI-RSVD	PMC-RSVD	42	41	+3.3V	SERR#	42
43	PAR	Ground	44	43	C/BE[1]#	Ground	44
45	V(I/O)	AD[15]	46	45	AD[14]	AD[13]	46
47	AD[12]	AD[11]	48	47	M66EN	AD[10]	48
49	AD[09]	+5V	50	49	AD[08]	+3.3V	50
51	Ground	C/BE[0]#	52	51	AD[07]	PMC-RSVD	52
53	AD[06]	AD[05]	54	53	+3.3V	PMC-RSVD	54
55	AD[04]	Ground	56	55	PMC-RSVD	Ground	56
57	V(I/O)	AD[03]	58	57	PMC-RSVD	PMC-RSVD	58
59	AD[02]	AD[01]	60	59	Ground	PMC-RSVD	60
61	AD[00]	+5V	62	61	ACK64#	+3.3V	62
63	Ground	REQ64#	64	63	Ground	PMC-RSVD	64

4.2 I/O Connector P14

PMC I/O connector P14 is wired to a VG64 – type connector (rows A – C).

Table 4: PMC I/O Connector P14

P14			
Pin	**Signal**	**Signal**	**Pin**
A1	PMC I/O2	PMC I/O1	C1
A2	PMC I/O4	PMC I/O3	C2
A3	PMC I/O6	PMC I/O5	C3
A4	PMC I/O8	PMC I/O7	C4
A5	PMC I/O10	PMC I/O9	C5
A6	PMC I/O12	PMC I/O11	C6
A7	PMC I/O14	PMC I/O13	C7
A8	PMC I/O16	PMC I/O15	C8
A9	PMC I/O18	PMC I/O17	C9
A10	PMC I/O20	PMC I/O19	C10
A11	PMC I/O22	PMC I/O21	C11
A12	PMC I/O24	PMC I/O23	C12
A13	PMC I/O26	PMC I/O25	C13
A14	PMC I/O28	PMC I/O27	C14
A15	PMC I/O30	PMC I/O29	C15
A16	PMC I/O32	PMC I/O31	C16
A17	PMC I/O34	PMC I/O33	C17
A18	PMC I/O36	PMC I/O35	C18
A19	PMC I/O38	PMC I/O37	C19
A20	PMC I/O40	PMC I/O39	C20
A21	PMC I/O42	PMC I/O41	C21
A22	PMC I/O44	PMC I/O43	C22
A23	PMC I/O46	PMC I/O45	C23
A24	PMC I/O48	PMC I/O47	C24
A25	PMC I/O50	PMC I/O49	C25
A26	PMC I/O52	PMC I/O51	C26
A27	PMC I/O54	PMC I/O53	C27
A28	PMC I/O56	PMC I/O55	C28
A29	PMC I/O58	PMC I/O57	C29
A30	PMC I/O60	PMC I/O59	C30
A31	PMC I/O62	PMC I/O61	C31
A32	PMC I/O64	PMC I/O63	C32

4.3 Power Connector P3

For stand-alone applications (PCI bus not connected or not used) power has to be supplied via power connector P3.

Table 5: Power Connector P3

P14			
Pin	**Signal**	**Signal**	**Pin**
1	NC	GND	2
3	GND	+5V	4

5 Known Bugs / Restrictions

none

6 Document's History

Version	Date	Description	Author
1.0	30.06.2006	initial version	ga
1.1	26.10.2006	adapted to HW version 1.1	ga
1.2	06.06.2007	chapters 2.4.3 and 2.4.4 added	ga