深圳开源通信有限公司

OpenVox-Best Cost Effective Asterisk Cards

OpenVox V100_PTMC hardware installation Manual

Written by: Carson Wang

Date: 11/24/2011

Version:1.00

深圳开源通信有限公司

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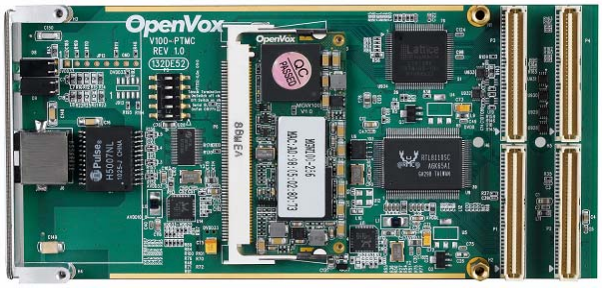
OpenVox-Best Cost Effective Asterisk Cards



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EMC (pending)

FCC Part 15 Class B
EN55022 Class B
EN55024

General Safety Instructions

WARNING

The PxCC that have V100_PTMC card installed must comply with the country specific safety regulations.

WARNING

Only service personnel should install V100_PTMC card.

WARNING

Before you install V100_PTMC card or remove the cover from your PMC carrier, Unplug the power cord from the computer.

WARNING

For avoiding personal injuries and damage to your computer, and

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V100_PTMC card, make sure the card' bezel is secured to the PMC carrier ' s Chassis ground by fastening the card with the screw.

WARNING

Electrical Surges,ESD are very destructive to the equipment. To avoid it,make sure there is a low impedance discharge path from your computer to Chassis ground.

WARNING

To reduce the risk of damage or injury,follow all steps or procedures as instructed.

Release History

Vesrsion	Date	Changes	Editor
1.00	11/24/2011	First preliminary release.	Carson Wang

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Conventions

If not otherwise specified, addresses maps are written in hexadecimal notation, identified by *0x*.

Table 1 gives a list of the abbreviations used in this document:

Table 1: List of used Abbreviations

Abbreviation	Description
AMR	A patented audio data compression scheme optimized for speech coding
Asterisk	A free software that transforms a computer into a communication server
CompactPCI	A 3U or 6U Eurocard-based industrial computer,where all boards are connected via a passive PCI backplane. The connector pin assignments are standardized by the PICMG US and PICMG Europe organizations.
DSP	Digital Signal Processor
FreeSWITCH	A free and open source communications software for the creation of voice and messaging products
G.729	An audio data compression algorithm for voice that compresses digital voice in packets of 10 milliseconds duration
G.726	An ITU-T ADPCM speech codec standard covering the transmission of voice at rates of 16, 24, 32, and 40 kbit/s
G.722	An ITU-T standard 7 kHz wideband speech codec operating at 48, 56 and 64 kbit/s
GSM-FR	The first digital speech coding standard used in the GSM digital mobile phone system
GSM-EFR	A digital speech coding standard used in the GSM digital mobile phone system
H.110	Popular industry standard telecom bus interfaces
IEEE	The Institute of Electrical and Electronics Engineers
iLBC	a FREE speech codec suitable for robust voice communication over IP
PCC	PCI Carrier Cards
PCI	Peripheral Component Interconnect
PICMG	PCI Industrial Computer Manufacturers Group
PMC	PCI Mezzanine Cards
PTMC	PCI Telecom Mezzanine Cards
PT2MC	PCI Mezzanine Cards supporting Configuration 2
PT2CC	PCI Carrier Cards supporting Configuration 2
PT3MC	PCI Mezzanine Cards supporting Configuration 3
PT3CC	PCI Carrier Cards supporting Configuration 3
PT5MC	PCI Mezzanine Cards supporting Configuration 5
PT5CC	PCI Carrier Cards supporting Configuration 5
TDM	Time Division Multiplex
UART	Universal Asynchronous Receiver/Transmitter
VoIP	Vocie Over IP

About This manunnal

This manunnal is technical reference for the V100_PTMC for CompactPCI.

Here is a brief description of the information that you will find in this manual.

Chapter 1 provides an overview of the V100_PTMC as well as a brief information regarding feature,Codec support ,target applications and system notification specifics.

Chapter 2 contains an indepth product diagram and necessary information for integrating the V100_PTMC into your CompactPCI system.

Chapter 3 contains the detailed information on unpacking and installing the

V100_PTMC into your PCCs .

Chapter 4 lists standards and references

Chapter 1 Overview

Overview

Because of its low bandwidth requirements, The voice data compression Codecs ,such as G.729,G.726,AMR,G.722,iLBC ,etc. are commonly used in VoIP applications.The G.711 Codecs is commonly used in legacy telephone network. For bridging TDM to VoIP connectivity ,it needs Codec transformation. Compared with transformation in software,The V100 ,Based Multicore-DSP ,can convert more sessions of transcoding,relieve the host CPU resources.

The V100 card, are rated to handle up to 32,64,128,256,400 bi-directional Codec transformations, without additional licensing fees [1] for transcoding.

The V100_PTMC is a PMC for transcoding.In additon, It is a PTMC for extending PMC to support stand telecom and telephony interfaces. It is usable with a wide range of PCC ,PT2CC,PT3CC,PT5CC.and can provide CompactPCI/fornt-panel Gbe/Backplane Gbe/Local CT media/control flow paths. These features can save the cost and support flexible applications.

The V100 can be worked with Asterisk® and FreeSWITCH® .In addition, the Media message-based API makes the development easy since the messages and media flow communicate between the PCC’s host and V100_PTMC through Ethernet interface .

Feature

- High density up to 30 to 400 Transcoding
- No addionnal License Fee[1]
- Compliant with PICMG 2.15(PTMC) electrical specification and IEEE 1386,IEEE1386.1(PMC)mechanical specifications
- Configurable for PT2MC/PT3MC/ PT5MC
- Local CT Bus allowing flexible routing of TDM timeslots both between the PTMC Sites and the H.110 backplane CT Bus.
- PT5MC includes Gbe connectivity to backplane resources
- PMC/PT2MC/PT3MC include Gbe connectivity to front panel
- Multi Media/Control Flow Paths
- Relieve Host CPU Load
- Release API for Integration
- OS : Linux and Windows
- Integrates in Asterisk® and FreeSWITCH®
- Support distributed or intergrated Application

Codec Support

- G.711
- G.722
- G.722.1
- G.726
- G.729AB
- GSM-FR
- GSM-EFR
- AMR
- AMR-WB (G.722.2)
- iLBC

1 Except for AMR and AMR-WB

Target Applications

•Hosted VoIP GateWay
•Conferencing Server
•IVR Server
•Distributed Office PBX
•Call Centers

Dimensions

- Compliant with IEEE1386 mechanical specifications
- 149.0x74.0mm (PCB)

Interface

•PCI :32bit 33/66MHz
•Local CT
•10/100/1000 BASE-T RJ45
•UART
•Backplane Gbe
•PMC Connector

Power Requirments

- 2.2A @3.3V

Operating Temperature Range

•0 - 50 ° C

Humidity

•10 TO 90% NON-CONDENSING

Hardware and Software Requirement

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•PCC, PT2CC, PT3CC, PT5CC
•Windows/Linux in Host

Chapter 2 Hardware Architecture

Figure 1 presents the functional blocks of the V100_PTMC.

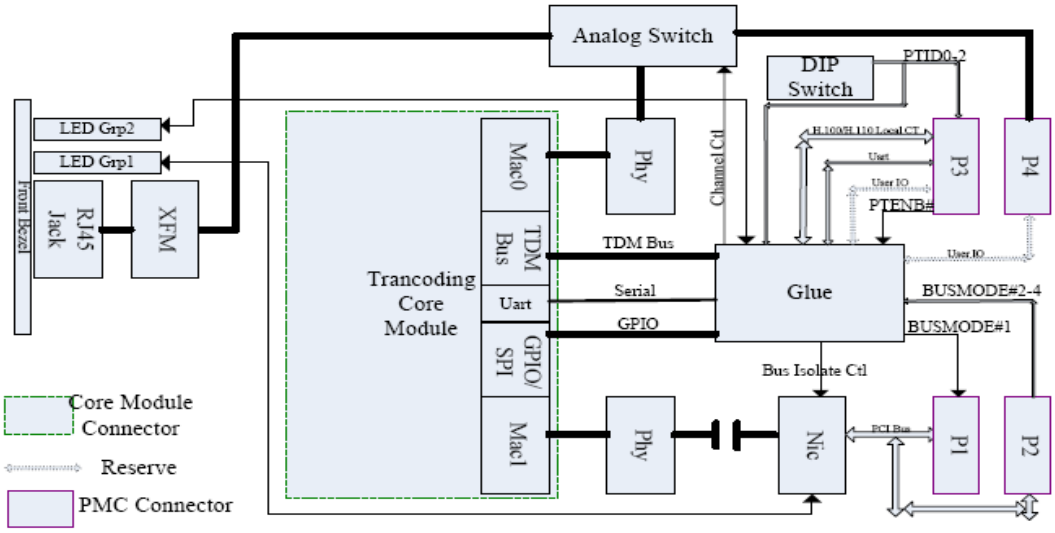

Figure 1 V100_PTMC Diagram

The flollowing is the V100_PTMC image

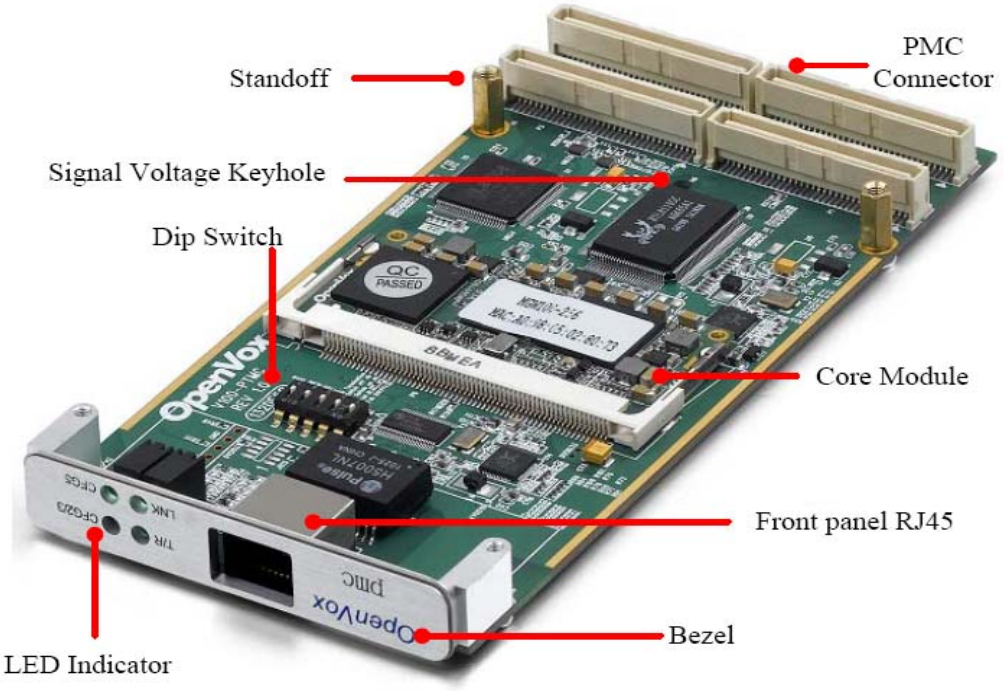

Figure 2 V100_PTMC

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Introduction

The V100_PTMC is a high density codec transcoding card. In addition, it is extended to provide voice quality processing features such as voice echo cancellation and adaptive noise reduction. The V100_PTMC is a PTMC, which is compliant with PCIMG2.15/ IEEE1386, IEEE1386.1, and can be integrated into customer's CompactPCI system. The V100_PTMC also features ethernet ports and local_CT Bus on board. And can handle IP TO IP transcoding or IP TO TDM transcoding.

The V100_PTMC is composed a core module and a PTMC extender board.

The core module contains Vocallo DSP , Ram, Flash, PowerSupply , UART, 2 Giga Macs and TDM bus interfaces. The extender PTMC board contains PMC connectors, Giga NIC, Glue , Dip Switch, front panel RJ45 interface. it connects core module and PCC/PTxCC.

Vocallo DSP and core module

The Vocallo DSP, which is used to address transcoding, is located in the core module, The media flow enters and exits through inherent Mac interfaces/TDM Bus interface. The control flow enters and exits through inherent Mac interfaces.

Giga NIC

The Giga NIC located in extender PMC board bridges the host located in PCC/PTxCC through PCI Bus to the vocallo DSP through Eth1.

Front panel RJ45

The front panel RJ45 in extender PMC board supports to provide the packet interface to access the DSP. In some applications, the remote host can communicate the Vocallo DSP through the front panel RJ45 interface. The interface is enable except PT5MC option is chosen.

P4 in PTMC connectors

The P4 is another packet interface to access the DSP. This interface is enable when PT5MC option is chosen.

PTMC connectors

There are four PTMC connectors, which are Compliant with PCIMG2.15(PTMC) electrical specification and IEEE1386, IEEE1386.1(PMC) mechanical specifications, located in V100_PTMC.

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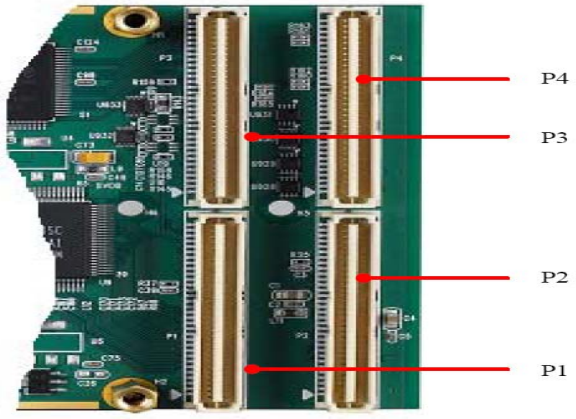

Figure 3 PMC Connectors in V100_PTMC

The following tables are the connectors Pin Assignments.

Table 2: P1,P1 Assignments

P1 32-Bit PCI			
Pin #	Signal Name	Signal Name	Pin #
1	Hi Z	Hi Z	2
3	Ground	INTA#	4
5	Hi Z	Hi Z	6
7	BUSMODE1#	Hi Z	8
9	Hi Z	PCI-RSVD	10
11	Ground	3.3Vaux	12
13	CLK	Ground	14
15	Ground	GNT	16
17	REQ#	Hi Z	18
19	V(I/O)	AD[31]	20
21	AD[28]	AD[2	22
23	AD[25]	Ground	24
25	Ground	C/BE[3]#	26
27	AD[22]	AD[21]	28
29	AD[19]	Hi Z	30
31	V(I/O)	AD[17]	32
33	FRAME	Ground	34
35	Ground	IRDY	36
37	DEVSEL#	Hi Z	38
39	PCIXCAP	Hi Z	40
41	PCI-RSVD	PCI-RSVD	42
43	PAR	Ground	44
45	V(I/O)	AD[15]	46
47	AD[12]	AD[11]	48
49	AD[09]	Hi Z	50
51	Ground	C/BE[0]#	52
53	AD[06]	AD[05]	54
55	AD[04]	Ground	56
57	V(I/O)	AD[03]	58
59	AD[02]	AD[01]	60
61	AD[00]	Hi Z	62
63	Ground	Hi Z	64

P2 32-Bit PCI			
Pin #	Signal Name	Signal Name	Pin#
1	Hi Z	Hi Z	2
3	Hi Z	RESERVED	4
5	RESERVED	Ground	6
7	Ground	PCI-RSVD	8
9	PCI-RSVD	PCI-RSVD	10
11	BUSMODE2#	+3.3V	12
13	RST#	BUSMODE3#	14
15	+3.3V	BUSMODE4#	16
17	PME#	Ground	18
19	AD[30]	AD[29]	20
21	Ground	AD[26]	22
23	AD[24]	+3.3V	24
25	IDSEL	AD[23]	26
27	+3.3V	AD[20]	28
29	AD[18]	Ground	30
31	AD[16]	C/BE[2]#	32
33	Ground	PMC-RSVD	34
35	TRDY#	+3.3V	36
37	Ground	STOP#	38
39	PERR#	Ground	40
41	+3.3V	SERR#	42
43	C/BE[1]#	Ground	44
45	AD[14]	AD[13]	46
47	M66EN	AD[10]	48
49	AD[08]	+3.3V	50
51	AD[07]	PMC-RSVD	52
53	+3.3V	PMC-RSVD	54
55	PMC-RSVD	Ground	56
57	PMC-RSVD	PMC-RSVD	58
59	Ground	PMC-RSVD	60
61	Hi Z	+3.3V	62
63	Ground	PMC-RSVD	64

High Impedance Reserved

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Table 3: P3 Assignments

P3 PT2MC/PT3MC/PT5MC			
Pin #	Signal Name	Signal Name	Pin #
1	Hi Z	Ground	2
3	Ground	STX	4
5	Hi Z	SRX	6
7	Hi Z	Ground	8
9	PTID2	Hi Z	10
11	PTGNDZ	Hi Z	12
13	Hi Z	Ground	14
15	Ground	Hi Z	16
17	CT_FA	Hi Z	18
19	CT_FB	Ground	20
21	PTID0	Hi Z	22
23	PTGNDZ	Hi Z	24
25	CT_C8A	Ground	26
27	Ground	CT_D19	28
29	CT_D18	CT_D17	30
31	CT_D16	Ground	32
33	Ground	Hi Z	34
35	CT_D14	Hi Z	36
37	CT_D12	Ground	38
39	PTENB#	Hi Z	40
41	PTGMDZ	Hi Z	42
43	CT_C8B	Ground	44
45	Ground	CT_D15	46
47	CT_D10	CT_D13	48
49	CT_D8	CT_D11	50
51	Ground	CT_D9	52
53	CT_D6	CT_D7	54
55	CT_D4	Ground	56
57	PTID1	CT_D5	58
59	CT_D2	CT_D3	60
61	CT_D0	Ground	62
63	Ground	CT_D1	64

H.110 slave Uart High Impedance

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Table 4: P4 Assignments

P4 PT5MC			
Pin #	Signal Name	Signal Name	Pin #
1	LPa_DA+	LPa_DC+	2
3	LPa_DA-	LPa_DC-	4
5	Ground	Ground	6
7	LPa_DB+	LPa_DD+	8
9	LPa_DB-	LPa_DD-	10
11	Ground	Ground	12
13	Hi Z	Hi Z	14
15	Hi Z	Hi Z	16
17	Ground	Ground	18
19	Hi Z	Hi Z	20
21	Hi Z	Hi Z	22
23	Ground	Ground	24
25	Hi Z	Hi Z	26
27	Hi Z	Hi Z	28
29	Hi Z	Hi Z	30
31	Hi Z	Hi Z	32
33	Hi Z	Hi Z	34
35	Hi Z	Hi Z	36
37	Hi Z	Hi Z	38
39	Hi Z	Hi Z	40
41	Hi Z	Hi Z	42
43	Hi Z	Hi Z	44
45	Hi Z	Hi Z	46
47	Hi Z	Hi Z	48
49	Hi Z	Hi Z	50
51	Hi Z	Hi Z	52
53	Hi Z	Hi Z	54
55	Hi Z	Hi Z	56
57	Hi Z	Hi Z	58
59	Hi Z	Hi Z	60
61	Hi Z	Hi Z	62
63	Hi Z	Hi Z	64

Giga Ethernet Link Port High Impedance

Glue

The glue located in extender PMC board bridges the UART and H.110 bus in PMC carrier/PTxCC to the Uart and TDM bus in core module.

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Table 5: Map List between core module and PMC Connectors

Core Module Signals		PMC Connector Signals	Description
TDM_IN[0]	←	CT_D0	
TDM_IN[1]	←	CT_D1	
TDM_IN[2]	←	CT_D2	
TDM_IN[3]	←	CT_D3	
TDM_IN[4]	←	CT_D4	
TDM_IN[5]	←	CT_D5	
TDM_IN[6]	←	CT_D6	
TDM_IN[7]	←	CT_D7	
TDM_OUT[0]	→	CT_D8	
TDM_OUT[1]	→	CT_D9	
TDM_OUT[2]	→	CT_D10	
TDM_OUT[3]	→	CT_D11	
TDM_OUT[4]	→	CT_D12	
TDM_OUT[5]	→	CT_D13	
TDM_OUT[6]	→	CT_D14	
TDM_OUT[7]	→	CT_D15	
TDM_CLK	←	CT_C8A	When GPIO18 in Core Module is high, CT_C8A maps to TDM_CLK. (Default)
		CT_C8B	When GPIO18 in Core Module is low, CT_C8B maps to TDM_CLK.
TDM_FR	←	CT_FA	When GPIO18 in Core Module is high, CT_FA maps to TDM_FR. (Default)
		CT_FB	When GPIO18 in Core Module is low, CT_FB maps to TDM_FR.
SERIAL_IN	←	STX	
SERIAL_OUT	→	SRX	

* For more flexible TDM customization , the source code and object code of glue can be acquired from OpenVox. The customers can rebuild the glue to suit their PTCC.

Dip Switch

The Dip switch located in **extender PMC board** is for configuring the V100_PTMC options.

The following is the Dip Switch Outline.

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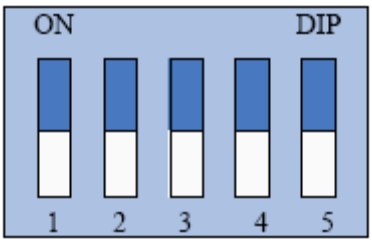

Figure 4 Dip Switch

Pin 1 is Vocallo DSP Device ID option. If it is switched ON, the DSP ID is *0x* FE, If it is switched Off(default) ,the DSP ID is *0x* FF. If dual V100_PTMCs are provided on the same PCC/PTCC, one of them should be set to *0x* FE ,and the other should be set to *0x* FF.

Pin 2 is TDM clock of Vocallo DSP enable option. If it is switched ON, The TDM clock is disable(default). If it is switched Off, the TDM clock is enable.

Pin3-Pin5 are PTMC configuration option. The V100_PTMC supports 3 PTMC configuration(PT2MC, PT3MC, PT5MC) via Pin3, Pin4, Pin5. On means 1, Off means 0. If Pin3-Pin5 is set to 010, PT2MC (default)configuration is enable. If Pin3-Pin5 is set to 011, PT3MC configuration is enable. If Pin3-Pin5 is set to 101, PT5MC configuration is enable.

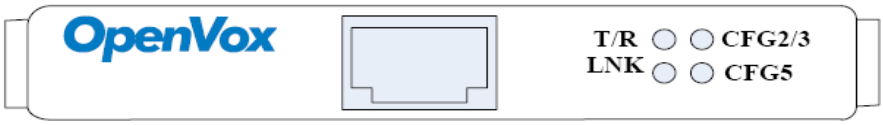

Figure 5 Front panel

LED indicator

There are 4 LEDs located in front panel. (See Figure 5)

The T/R blinking indicates the front panel RJ45 packet interface or P4 in PTMC connectors packet interface is transmitting or receiving.

The LNK light indicates he front panel RJ45 packet interface or P4 in PTMC connectors packet interface is linking up.

The CFG2/3 is PT2MC/PT3MC indicator. Red light means V100_PTMC is PT2MC option and the PTCC is PT2CC compliant. Green light means V100_PTMC is PT3MC option and the PTCC is PT3CC compliant.

The CFG5 is PT5MC indicator. Green light means V100_PTMC is PT5MC option and the PTCC is PT5CC compliant.

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Chapter 3 Hardware installation

1. Make sure the V100_PTMC is compatible with your PCC/PTCC. V100_PTMC can be worked with PCC32, PCC64, PT2CC, PT3CC and PT5CC theoretically. In practice, Electrical compatibility of combinations that include user-defined I/O, whether PMC or PTMC compliant, must be checked carefully. The V100_PTMC I/O pins is 5V tolerant for 3.3V. It is recommended that you ask OpenVox whether the V100_PTMC suit your application.

* V100_PTCCEVB that is a PCI card for evaluating V100_PTMC is available.

2. Unpacking

Inspect the packing container for any damage. If this container appears damaged, immediately contact the company responsible for the shipping and report the damage before opening and unpacking the container. It is recommended that you also notify OpenVox.

3. Make sure the PCC/PTxCC that have V100_PTMC installed complies with the country specific safety regulations.
4. Power off your PCC/PTxCC and unplug it from its AC power source.
5. Attach a Anti-static Wrist Strap to your wrist.
6. Configuring the Dip Switch to the right position.
7. Open the cover of the CompactPCI Platform.
8. Remove the filler plate from the front panel of the PCC/PTxCC . (See Figure 6)
9. The V100_PTMC must be positioned with care to avoid damaging components against the voltage keying post.
10. The V100_PTMC bezel enters the front panel of the PCC/PTxCC into alignment with the signal connectors. (See Figure 6)
11. Mounting the screws. (See Figure 6)
12. Replace the cover of the PCC/PTxCC.
13. Plug the UTP cable into RJ45 Jack of the V100 only if the Media/Control Path is the front panel RJ45/UTP.
14. Plug the AC power source. and follow the software installation manual.

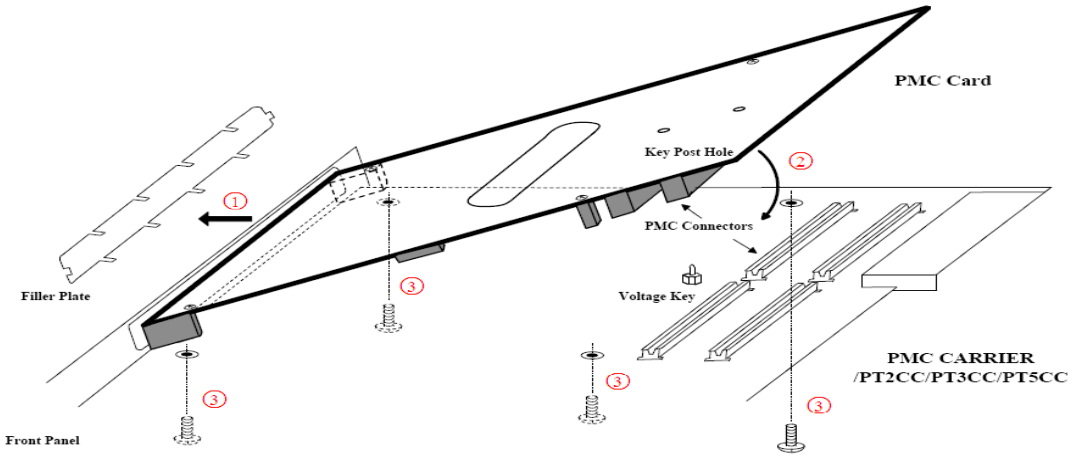

Figure 6 View V100_PTMC Installation

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Chapter 4 References

- ECTF H.110 Hardware Compatibility Specification: CT Bus revision 1.0
- IEEE P1386 2.4a March 21, 2001 Common Mezzanine Card Family
- IEEE P1386.1 Draft 2.4 Jan. 12, 2001 PCI Mezzanine Cards, PMC
- PCI Local Bus Specification Revision 2.2
- PICMG 2.15 1.0 PCI Telecom Mezzanine/Carrier Card Specification
- PICMG 2.15 R1.0:ECN 2.15-1.0-001 10/100/1000 Ethernet MDI Links on PTMC
- PICMG 2.16 R1.0 CompactPCI Packet Switch Backplane
- PICMG 2.5 R1.0 Computer Telephony
- PICMG 2.9 R1.0 CompactPCI System Management Specification
- VITA 32 -199x Processor PMC Standard Draft 0.41 Sept. 8, 2000
- VITA 39 -2003(R2009) PCI-X Auxiliary Standard for PMCs and Processor PMCs

FCC NOTE:
This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:
1. This device may not cause harmful interference, and
2. This device must accept any interference received, including interference that may cause undesired operation.

FCC CAUTION
changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

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