VIPci 960

Half-Size PCI/ISA Backplane

Technical Reference Manual
Version 1.1, May 1999

Note: The latest releases of the Technical Reference Manuals are available at:
ftp://ftp.kontron.ca/Support/Product_Manuals/

kontron
www.kontron.com

Ref. : M960_1-1

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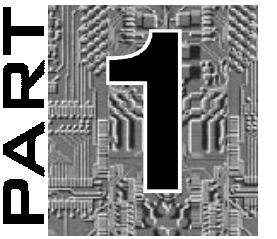
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PRODUCT DESCRIPTION

1. FEATURES

2. CABLES AND CONNECTION TABLES

3. SETTING JUMPERS

1. FEATURES

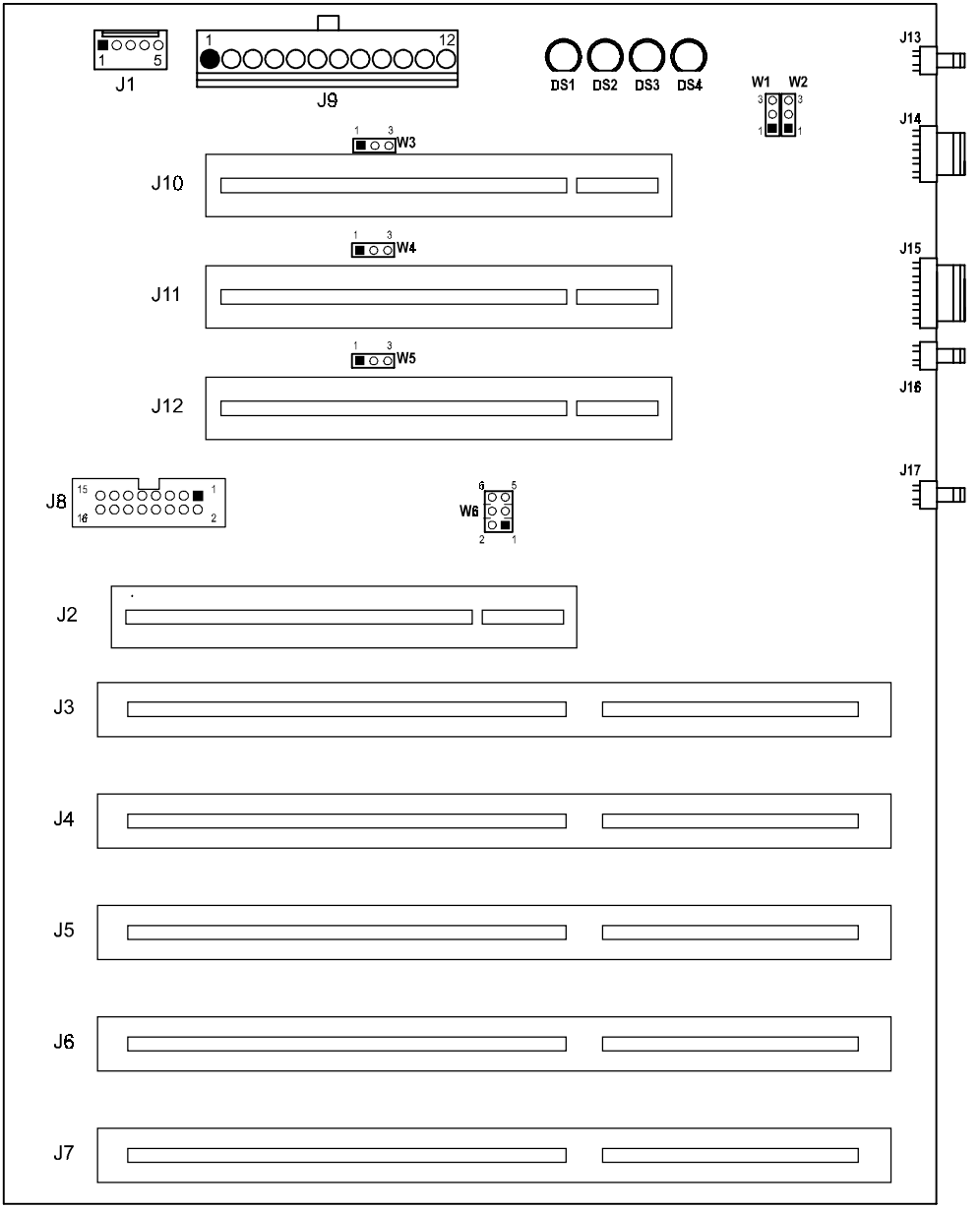
The VIPci 960 Half-Size PCI/ISA Passive Backplane, used with the T076 PC/104-Plus adapter, makes it possible for Teknor's half-size Single Board Computer (VIPer serie) equipped with the PC/104-Plus expansion connector, to drive both ISA and PCI bus segments.

The VIPci 960 has provisions for system slot, four ISA slots, and three PCI slots. It is the perfect alternative to the "PISA" bus architecture.

The VIPci 960 Passive Backplane features the following:

- Four ISA slots
- Three PCI slots (5V/32-bit)
- One PCI/ISA adapted system slot using the T076 PC/104-Plus adapter
- One 12-position Industry standard power supply header
- TEKNOR's 16-pin multifunction box header to connect standard I/O signals from the single board to the blackplane
- Baby-AT compatible mounting hole locations (8)
- Standard AT I/O friction lock headers (Keyboard, Power ON LED, Keyboard Inhibit, Hard Disk Activity LED, Reset Switch, Speaker, and Download)
- 0.062" thickness board (4 layers)
- Mounting holes can easily be isolated from the chassis ground
- Impedance is controlled to 65 ohms ±15% (external layer)
- Termination network resistors on the ISA bus (mounted on socket)
- Power ON LED jumper to select the power source to be applied to the Power LED (from SBC or local power)
- Reset Source jumper to select whether the power good signal of the power supply or the external reset push button is connected to the SBC to generate a hardware reset
- Bus Mastering Configuration jumpers (PCI bus)
- Four voltage presence LEDs (+5V, -5V, -12V and +12V)

1.1 VIPCI 960 FUNCTIONAL DIAGRAM

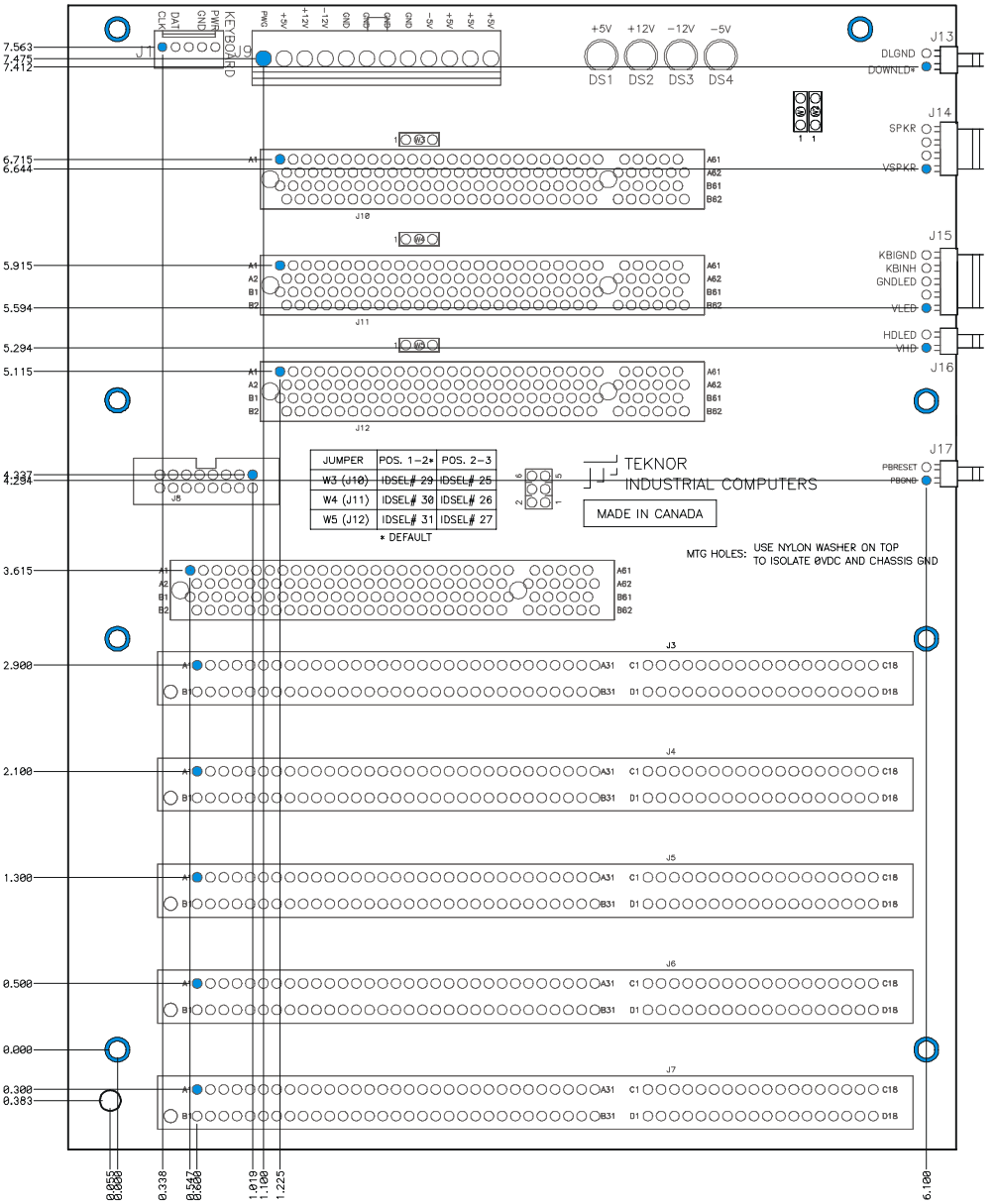


1.2 VIPCI 960 BOARD SPECIFICATIONS

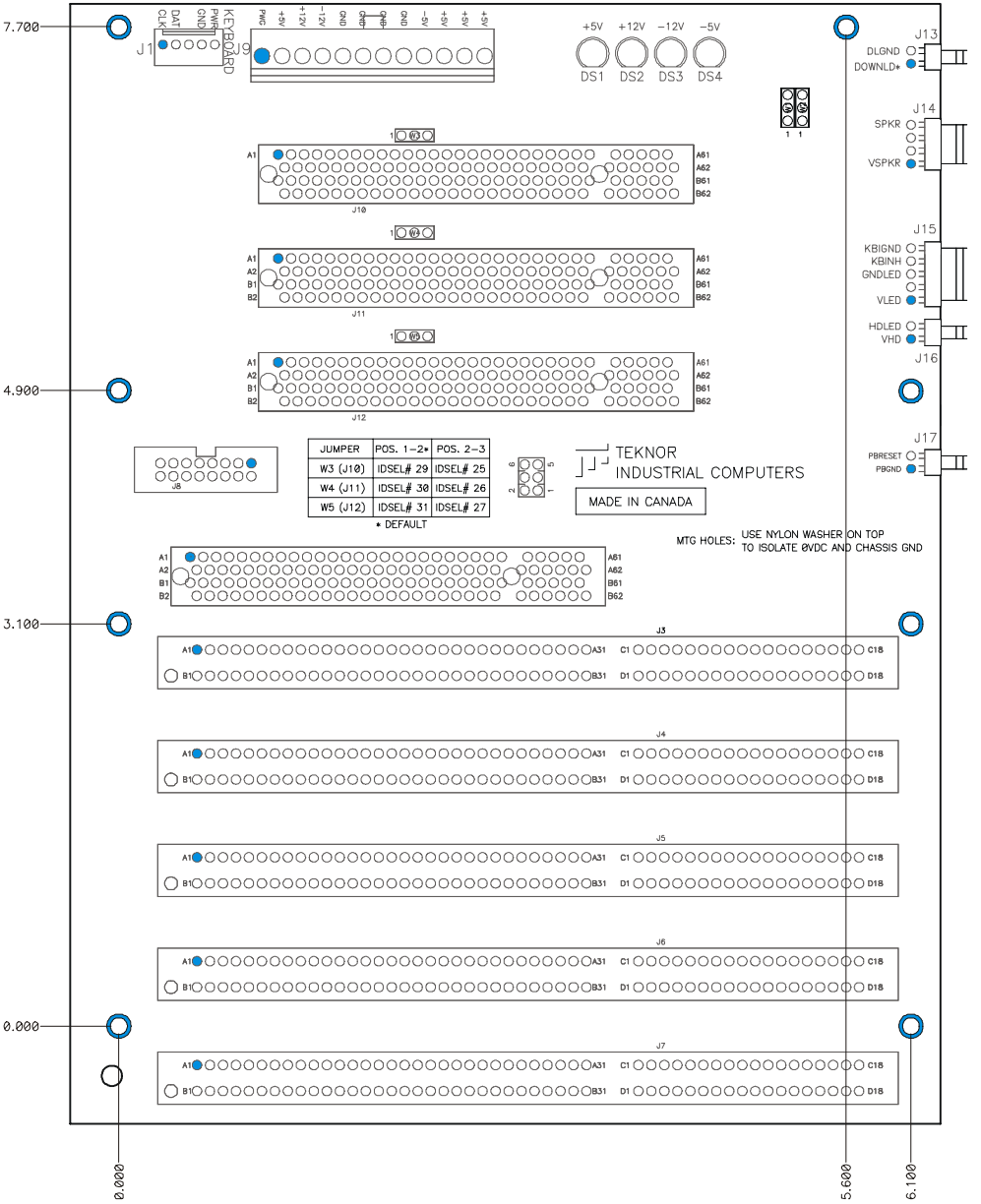
FEATURES	SPECIFICATIONS
VIPci 960	Half-Size PCI-ISA Passive Backplane
Standard	Conforms to the electrical specifications in IEEE P996 Personal Computer Bus Standard (ISA connectors). ISA Bus is terminated with AC Termination Resistor Network (on socket) PCI bus rev 2.1 and pending PICMG approval
Power Requirements (external, fused)	Voltage — Current +5V — 16A +12V — 4A -12V — 4A -5V — 4A
Connectors	J1 Keyboard header J2 System slot (PCI segment for connecting the T076 adapter) J3 System slot (ISA segment for connecting the SBC) J4-J7 ISA slots J8 TEKNOR Multi-Function Header J9 12-pin Industry Standard Power Supply header J10 PCI slot (IDSEL 29 or 25 assignation capable) J11 PCI slot (IDSEL 30 or 26 assignation capable) J12 PCI slot (IDSEL 31 or 27 assignation capable) J13 Download J14 Speaker J15 Power ON LED / Keyboard Inhibit J16 Hard Disk Activity LED J17 Reset Switch
Jumpers	W1 *Power LED VCC Source Selection Jumper* 1-2: External Single Board Computer Voltage (through J15) 2-3: Local Backplane Voltage W2 *Reset Input Selection Jumper* 1-2: Reset connected to local Reset switch 2-3: Reset connected to Power Good signal W3 *PCI J10 IDSEL Assignation Jumper* 1-2 *: IDSEL 29 (VIPer 825) 2-3: IDSEL 25 (VIPer 826) W4 *PCI J11 IDSEL Assignation Jumper* 1-2 *: IDSEL 30 (VIPer 825) 2-3: IDSEL 26 (VIPer 826) W5 *PCI J12 IDSEL Assignation Jumper* 1-2 *: IDSEL 31 (VIPer 825) 2-3: IDSEL 27 (VIPer 826) * Default Setting

FEATURES	SPECIFICATIONS
Voltage Presence Indicators	DS1: +5V DS2: +12V DS3: -12V DS4: -5V
Overall Dimensions	8.626 in. x 6.700 in.(219.10mm x 170.18mm).
Total Thickness	0.062 in. ±0.007 in. / 1.57mm ±0.18mm.
Numbers of Layers	2 signal layers, 2 power distribution planes.
Mounting Holes	Eight 0.156 in. / 3.96mm unplated mounting holes with external ties to logic GND. Baby-AT compatible.
Impedance (ISA Bus)	65 ohms ±15%.
Operating Temp.	0°C to 85°C (32F to 185F)
Humidity	0% – 95% R.H., non-condensing.
MTBF	Mean Time Between Failures: over 500,000 hours (MIL-HDBK-217F)
Safety	Designed to meet or exceed: Safety: UL 1950, CSA C22.2 No.950 EN 60950, IEC950 EMI/EMC/ESD FCC 47 CFR Part 15/ CISPR22, CE Mark to EN55022/EN50082

1.3 MECHANICAL SPECIFICATION DIAGRAM – CONNECTORS



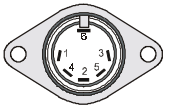
1.4 MECHANICAL SPECIFICATION DIAGRAM – MOUNTING HOLES:



2. CABLES AND CONNECTION TABLES

2.1 KEYBOARD (J1)

Specifications: 5-pin straight friction header.

Keyboard		Signal Description	User End Connection	
1	KBCLK	Keyboard Clock	1	
2	KBDAT	Keyboard Data	2	
3	N.C.	Not Connected	4	
4	KBGND	Keyboard Return	4, 6	
5	KBPWR	Keyboard Power	5	

5-pin DIN connector
(back view)

2.2 ONBOARD SLOTS

System slot . J2: PCI segment . J3: ISA segment	When using a TEKNOR's half-size ISA (VIPer board) with a PC/104-Plus interface, and the T076 adapter module, the VIPci 960 supports combined PCI/ISA expansion applications. Pinouts are provided in Appendix-B.
J4 – J7 ISA slots	Pinouts are provided in Appendix-B.
J10 – J12 PCI slots	Refer to Section 3 – Setting Jumpers for information on the IDSEL number assignation according to each PCI slot. Refer to table below for more information on the interrupt binding assigned on the PCI slots.

PCI INTERRUPT BINDING

	SYSTEM	PERIPHERALS		
Pin number	**J2**	**J10**	**J11**	**J12**
A6	INTA	INTD	INTC	INTB
B7	INTB	INTA	INTD	INTC
A7	INTC	INTB	INTA	INTD
B8	INTD	INTC	INTB	INTA

2.3 MULTIFUNCTION CONNECTOR (J8)

The Multifunction connector distributes TEKNOR's Multifunction signals onto several individual headers. Signals are split as the follows:

Multifunction		Signal Description	Backplane Headers	
1	KBCLK	Keyboard Clock	1	**J1**: 5-pin lock header Pin 3 = N.C.
2	KBGND	Keyboard Return	4	
3	KBDAT	Keyboard Data	2	
5	KBPWR	Keyboard Power	5	
6	VLED	VCC Power LED	1[1]	**J15**: 5-pin lock header Pin 2 = N.C. Pin 3 = GND
9	KBINH	Keyboard Inhibit	4	
10	KBINHRET	Keyboard Inhibit Return	5	
7	SPKR	Speaker Return	4	**J14**: 4-pin lock header Pins 2, 3 = N.C.
8	VSPKR	Speaker Power	1	
11	DOWNLD*	VT-100 Download (Active Low Signal)	1	**J13**: 2-pin lock header
12	DLGND	VT-100 Download Return	2	
13	PBRES	Push Button Reset Switch	1[2]	**J17**: 2-pin lock header
14	PBRESRET	Push Button Reset Return	2	
15	HDLED	Hard Drive LED Return	2	**J16**: 2-pin lock header
16	VHD	Hard Drive LED	1[3]	
4	-	Not Connected		

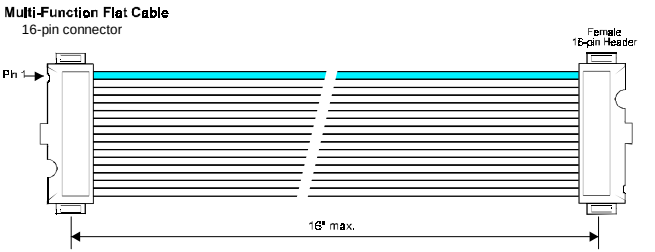
Note 1: The VCC Power LED circuit is protected by a current limiting resistor (330 Ohms). No external resistor is required.

See also Section 3.1 – *Setting Jumpers, Vcc Power LED* to select the VCC power source.

Note 2: The Push Button Reset line (PBRES) is tied by default to the Push Button Reset header of the backplane through the W2 jumper (2-3). To handle a reset from the PWRGOOD line, set the W2 jumper to position 1-2 (See Section 3.2 – *Setting Jumpers, Reset Input Selection*).

Note 3: The Hard Drive LED circuit is protected by a limiting current resistor (330 Ohms). No external resistor is required.

A 16 pin-to-pin adapter cable is required to carry the Multifunction signals from the Single Board Computer to the Multifunction connector on the backplane. Such a cable is available from TEKNOR, #150-253-01.

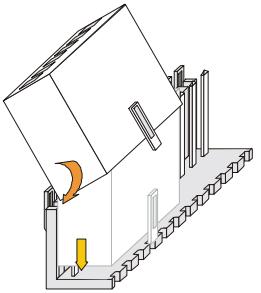


2.4 POWER SUPPLY (J9)

Specifications: 12-pin straight Industry Standard power supply header.

Power Supply		Signal Description
1	PWRGOOD	The power unit uses this pin to indicate it is providing correct voltage levels
2	VCC (+5V)	External +5V supply. Board max current value: 30A
3	+12V	External +12V supply. Board max current value: 8A
4	-12V	External -12V supply. Board max current value: 8A
5	GND	Ground
6	GND	
7	GND	
8	GND	
9	-5V	External -5V supply. Board max current value: 8A
10	+5V	External +5V supply. Board max current value: 30A
11		
12		

To insert the mating connector into the power supply header, follow these steps:



1. First insert the mating connector's keys into the key inserts by placing the mating connector at a 30° angle.
2. Rotate the mating connector to a vertical position.
3. Slide the mating connector into the power supply header.

2.5 DOWNLOAD (J13)

Specifications: 2-pin right-angle friction header.

VT-100		Signal Description	User End Connection	
1	DOWNLD*	VT-100 Download (Active Low Signal)		Use a N/O switching device
2	DLGND	VT-100 Download Return		

2.6 SPEAKER (J14)

Specifications: 4-pin right-angle friction header.

Speaker		Signal Description	User End Connection
1	VSPKR	Speaker Power	Standard 8 ohm speaker connects directly to pins 1 and 4
2	N.C.	Not Connected	
3	N.C.	Not Connected	
4	SPKR	Speaker Return	

2.7 POWER LED / KEYBOARD INHIBIT (J15)

Specifications: 5-pin right-angle friction header.

Pwr LED / Kb Inhib		Signal Description	User End Connection
1	VLED	VCC Power LED	Connect LED to pins 1 (A) and 3 (K). 330 ohm resistor is integrated (see Note 1).
2	N.C.	Not Connected	
3	GND	Ground	
4	KBINH	Keyboard Inhibit	Short Pin 1-2 to inhibit the keyboard (See Note 2).
5	KBINHRET	Keyboard Inhibit Return	

Note 1: To select the VCC power source, please refer to Section 3.1 – *Setting Jumpers, Vcc Power LED.*

Note 2: The Keyboard Inhibit function is not available on all TEKNOR single board computers.

2.8 HARD DRIVE LED (J16)

Specifications: 2-pin right-angle friction header.

Hard Drive LED		Signal Description	User End Connection
1	VHD	Hard Drive LED	Anode (See Note)
2	HDLED	Hard Drive LED Return	Cathode

Note: The circuit is protected by a 330ohm current limiting resistor.

2.9 RESET PUSH BUTTON (J17)

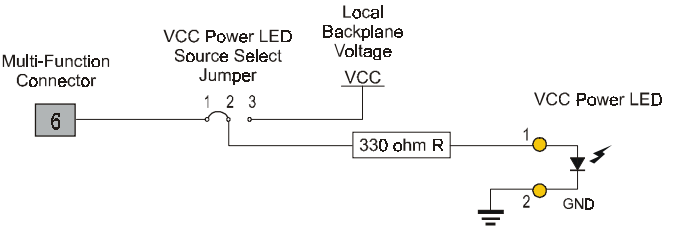
Specifications: 2-pin right-angle friction header.

Reset Button		Signal Description	User End Connection
1	PBRES	Push Button Reset Switch	Short Pin 1-2 to reset the CPU board (See Note).
2	PBRESRET	Push Button Reset Return	

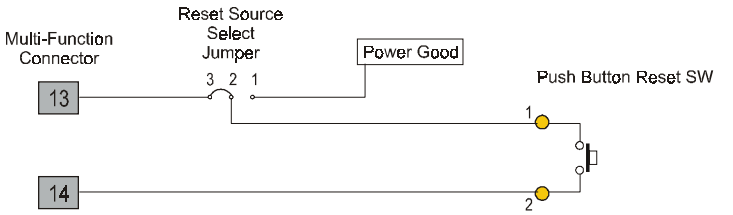
Note: To select the reset source, please refer to Section 3.2 – *Setting Jumpers, Reset Input Selection.*

3. SETTING JUMPERS

3.1 W1 – VCC POWER LED



3.2 W2 – RESET INPUT SELECTION



3.3 W3, 4, 5 – PCI IDSEL ASSIGNATION

Jumper	Position 1-2 * (VIPer 825)	Position 2-3 (VIPer 826)
W3	IDSEL29 assigned to J10	IDSEL25 assigned to J10
W4	IDSEL30 assigned to J11	IDSEL26 assigned to J11
W5	IDSEL31 assigned to J12	IDSEL27 assigned to J12

* Default settings



APPENDICES

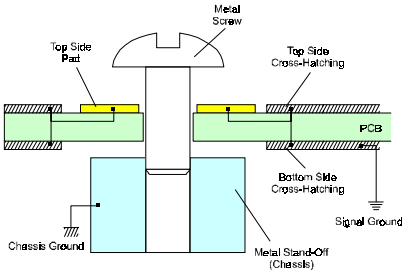
A. INSTALLATIONS

B. PINOUTS

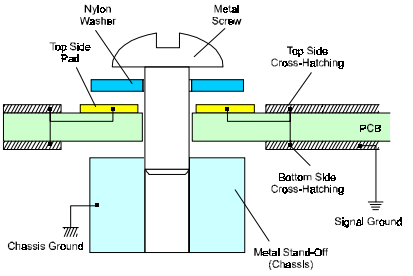
A. INSTALLATIONS

A.1 ATTACHING THE BACKPLANE TO AN ENCLOSURE

When attaching the backplane to its enclosure, fasten it with metal screws to connect the Signal Ground to the Chassis Ground, or use metal screws and nylon washers if the Signal Ground needs to be isolated from the Chassis Ground.



Signal Ground and Chassis Ground Connected



Signal Ground and Chassis Ground Isolated by Using a Nylon Washer

The above illustration shows how the Top Side Pads are connected to the Signal Ground. Since these pads do not touch the screw, using nylon washers will effectively isolate the screws from the Signal Ground.

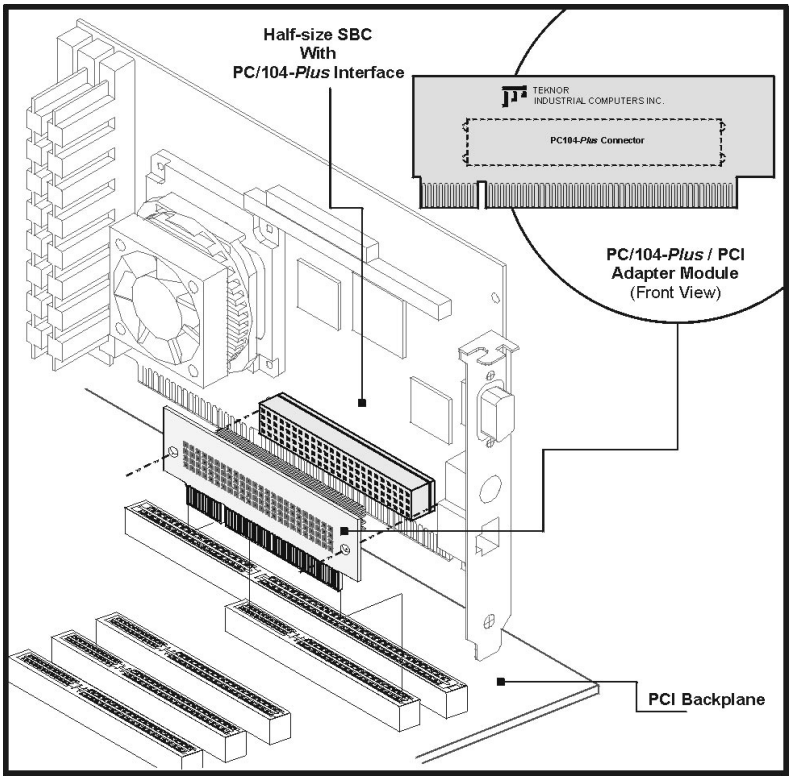
To ensure optimal mechanical rigidity, it is highly recommended to use as many of the mounting holes as possible when installing the backplane in the enclosure.

A.2 INSTALLING A VIPER BOARD WITH THE T076 ADAPTER MODULE

To take advantage of the PCI bus segment of the backplane, the VIPci 960 must be used jointly with a VIPer single board computer equipped with a PC/104-Plus interface ant the T076 adapter module from TEKNOR.

Proceed as follows:

1. Install the T076 module on the PC/104-Plus interface of your SBC.
2. Connect the SBC/T076 assembly to the system slot of the backplane (J2 and J3).



A.3 INSTALLING PERIPHERAL BOARDS

⚠ CAUTION

When installing boards, make sure the system is completely powered down.

Since static electricity can damage electronic components, the following precautions should be taken whenever you handle any board you want to install:

- Keep any board you want to install in its antistatic package, until you are ready to install it.
- Touch a grounded surface before touching electronic components.
- When handling boards, touch a grounded surface often or wear a grounding wrist strap. This will discharge any static electricity that may have built up on your body.
- Handle boards by the edges.

PCI peripheral boards can be installed on J10-J12 slots, while ISA peripheral boards can be installed on J3-J7 slots. Only one CPU board must be installed on the backplane (J2-J3).

Since the boards and the slots are keyed, it will not be possible to insert a board in the wrong direction.

B. PINOUTS

B.1 HARD DRIVE LED

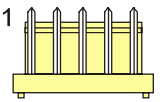
Specifications: 2-pin right-angle friction header.



Hard Drive LED		Mating Connector
1	VHD	Molex: 22-01-3027 (housing) Molex: 08-50-0114 (crimp)
2	HDLED	

B.2 KEYBOARD

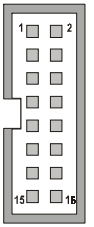
Specifications: 5-pin straight friction header.



Keyboard Header		Mating Connector
1	KBCLK	Molex: 22-01-3057 (housing) Molex: 08-50-0114 (crimp)
2	KBDAT	
3	N.C.	
4	KBGND	
5	KBPWR	

B.3 MULTIFUNCTION CONNECTOR

Specifications: 16-pin IDC box header.



Pin #	Signal	Pin #	Signal
1	KBCLK	2	KBGND
3	KBDAT	4	N.C.
5	KBPWR	6	VLED
7	SPKR	8	VSPKR
9	KBINH	10	KBINHRET
11	DOWNLD*	12	DLGND
13	PBRES	14	PBRESRET
15	HDLED	16	VHD

Mating Connectors

AMP: 746285-3

Robinson Nugent: IDS-C16PK-TG

Thomas & Betts: 622-1630

B.4 POWER LED / KEYBOARD INHIBIT

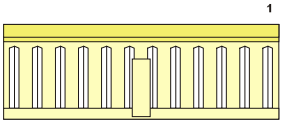
Specifications: 5-pin straight friction header.



Pwr LED / Kb Inhib		Mating Connector
1	VLED	Molex: 22-01-3057 (housing) Molex: 08-50-0114 (crimp)
2	N.C.	
3	GND	
4	KBINH	
5	KBINHRET	

B.5 POWER SUPPLY

Specifications: 12-pin straight Industry Standard power supply header.



Power Supply		Mating Connector
1	PWRGOOD	Molex: 90331-0001 (housing) Molex: 08-50-0277 (crimp)
2	VCC (+5V)	
3	+12V	
4	-12V	
5	GND	
6	GND	
7	GND	
8	GND	
9	-5V	
10	+5V	
11		
12		

B.6 RESET PUSH BUTTON

Specifications: 2-pin right-angle friction header.



Reset Button		Mating Connector
1	PBRES	Molex: 22-01-3027 (housing) Molex: 08-50-0114 (crimp)
2	PBRESRET	

B.7 SPEAKER

Specifications: 4-pin right-angle friction header.



Speaker		Mating Connector
1	VSPKR	Molex: 22-01-3047 (housing) Molex: 20-50-0114 (crimp)
2	N.C.	
3	N.C.	
4	SPKR	

B.8 VT-100

Specifications: 2-pin right-angle friction header.

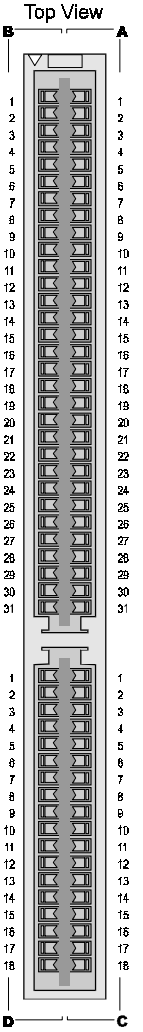


VT-100		Mating Connector
1	DOWNLD*	Molex: 22-01-3027 (housing) Molex: 08-50-0114 (crimp)
2	DLGND	

B.9 ISA SLOTS (SYSTEM AND PERIPHERALS)

PIN	Signal Name	I/O
A Side		
A1	IOCHCHK*	I
A2	SD7	I/O
A3	SD6	I/O
A4	SD5	I/O
A5	SD4	I/O
A6	SD3	I/O
A7	SD2	I/O
A8	SD1	I/O
A9	SD0	I/O
A10	IOCHRDY	I
A11	AEN	O
A12	SA19	I/O
A13	SA18	I/O
A14	SA17	I/O
A15	SA16	I/O
A16	SA15	I/O
A17	SA14	I/O
A18	SA13	I/O
A19	SA12	I/O
A20	SA11	I/O
A21	SA10	I/O
A22	SA9	I/O
A23	SA8	I/O
A24	SA7	I/O
A25	SA6	I/O
A26	SA5	I/O
A27	SA4	I/O
A28	SA3	I/O
A29	SA2	I/O
A30	SA1	I/O
A31	SA0	I/O
C Side	----------	---------
C1	SBHE*	I/O
C2	LA23	I/O
C3	LA22	I/O
C4	LA21	I/O
C5	LA20	I/O
C6	LA19	I/O
C7	LA18	I/O
C8	LA17	I/O
C9	MEMR*	I/O
C10	MEMW*	I/O
C11	SD08	I/0
C12	SD09	I/O
C13	SD10	I/O
C14	SD11	I/O
C15	SD12	I/O
C16	SD13	I/O
C17	SD14	I/O
C18	SD15	I/O

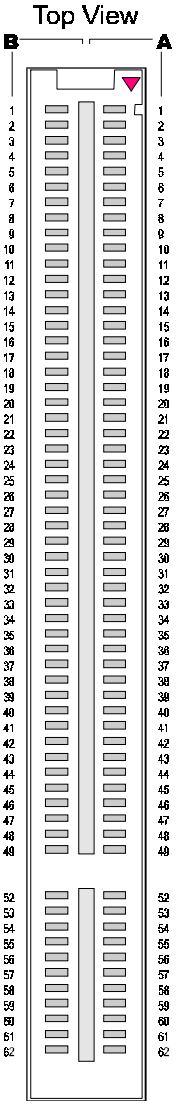
PIN	Signal Name	I/O
C Side		
B1	GND	-
B2	RESETDRV	O
B3	VCC (+5V)	-
B4	IRQ9	I
B5	-5V	-
B6	DRQ2	I
B7	-12V	-
B8	ENDXFR*	I
B9	+12V	-
B10	GND	-
B11	SMEMW*	O
B12	SMEMR*	O
B13	IOW*	I/O
B14	IOR*	I/O
B15	DACK3*	O
B16	DRQ3	I
B17	DACK1*	O
B18	DRQ1	I
B19	REFRESH*	I/O
B20	SYSCLK	O
B21	IRQ7	I
B22	IRQ6	I
B23	IRQ5	I
B24	IRQ4	I
B25	IRQ3	I
B26	DACK2*	O
B27	TC	O
B28	BALE	O
B29	VCC	-
B30	OSC	O
B31	GND	-
D Side	----------	---------
D1	MEMCS16*	I
D2	IOCS16*	I
D3	IRQ10	I
D4	IRQ11	I
D5	IRQ12	I
D6	IRQ15	I
D7	IRQ14	I
D8	DACK0*	O
D9	DRQ0	I
D10	DACK5*	O
D11	DRQ5	I
D12	DACK6*	O
D13	DRQ6	I
D14	DACK7*	O
D15	DRQ7	I
D16	VCC (+5V)	-
D17	MASTER*	I
D18	GND	-



* Active low signal

B.10 PCI SYSTEM SLOT

A SIDE			B SIDE		
Pin	**J6 Signal Name**	**I/O**	**PIN**	**J6 Signal Name**	**I/O**
A1	N.C.	-	B1	-12VDC	-
A2	+12VDC	-	B2	N.C.	-
A3	N.C.	-	B3	GND	-
A4	N.C.	-	B4	N.C.	-
A5	VCC	-	B5	VCC	-
A6	INTA*	O	B6	VCC	-
A7	INTC*	O	B7	INTB*	O
A8	VCC	-	B8	INTD*	O
A9	CLKC	-	B9	N.C.	-
A10	VCC	-	B10	REQ1*	-
A11	N.C.	-	B11	N.C.	-
A12	GND	-	B12	GND	-
A13	GND	-	B13	GND	-
A14	GNT1*	-	B14	CLKA	-
A15	RST*	I	B15	GND	-
A16	VCC	-	B16	CLKB	I
A17	GNT0*	I	B17	GND	-
A18	GND	-	B18	REQ0*	O
A19	REQ2*	-	B19	VCC	-
A20	AD30	I/O	B20	AD31	I/O
A21	N.C.	-	B21	AD29	I/O
A22	AD28	I/O	B22	GND	-
A23	AD26	I/O	B23	AD27	I/O
A24	GND	-	B24	AD25	I/O
A25	AD24	I/O	B25	N.C.	-
A26	GNT2*	I	B26	C/BE3*	I/O
A27	N.C.	-	B27	AD23	I/O
A28	AD22	I/O	B28	GND	-
A29	AD20	I/O	B29	AD21	I/O
A30	GND	-	B30	AD19	I/O
A31	AD18	I/O	B31	N.C.	-
A32	AD16	I/O	B32	AD17	I/O
A33	N.C.	-	B33	C/BE2*	I/O
A34	FRAME*	I/O	B34	GND	-
A35	GND	-	B35	IRDY*	I/O
A36	TRDY*	I/O	B36	N.C.	-
A37	GND	-	B37	DEVSEL*	O
A38	STOP*	I/O	B38	GND	-
A39	N.C.	-	B39	LOCK*	I/O
A40	SBC_SDONE	I/O	B40	PERR*	I/O
A41	SBC_SBO*	I/O	B41	Not Used	-
A42	GND	-	B42	SERR*	O
A43	PAR	I/O	B43	N.C.	-
A44	AD15	I/O	B44	C/BE1*	I/O
A45	N.C.	-	B45	AD14	I/O
A46	AD13	I/O	B46	GND	-
A47	AD11	I/O	B47	AD12	I/O
A48	GND	-	B48	AD10	I/O
A49	AD09	I/O	B49	GND	-
	Connector Key			Connector Key	
	Connector Key			Connector Key	
A52	C/BE0*	I/O	B52	AD08	I/O
A53	Not Used	-	B53	AD07	I/O
A54	AD06	I/O	B54	N.C.	-
A55	AD04	I/O	B55	AD05	I/O
A56	GND	-	B56	AD03	I/O
A57	AD02	I/O	B57	GND	-
A58	AD00	I/O	B58	AD01	I/O
A59	VCC	-	B59	VCC	-
A60	N.C.	-	B60	N.C.	-
A61	VCC	-	B61	VCC	-
A62	VCC	-	B62	VCC	-



* Active low signal

GETTING HELP

At TEKNOR we take great pride in our customer's successes. We strongly believe in providing full support at all stages of your product development.

If at any time you encounter difficulties with your application or with any of our products, or if you simply need guidance on system setups and capabilities, you may contact our Technical Support department at:

CANADIAN HEADQUARTERS

Tel.: (450) 437-5682

Fax: (450) 437-8053

If you have any questions about TEKNOR, our products or services, you may reach us at the above numbers or by writing to:

TEKNOR INDUSTRIAL COMPUTERS INC.

616 Cure Boivin

Boisbriand, Quebec

J7G 2A7 CANADA

LIMITED WARRANTY

TEKNOR INDUSTRIAL COMPUTERS INC. ("the seller") warrants its boards to be free from defects in material and workmanship for a period of two (2) years commencing on the date of shipment. The liability of the seller shall be limited to replacing or repairing, at the seller's option, any defective units. Equipment or parts which have been subject to abuse, misuse, accident, alteration, neglect, or unauthorized repair are not covered by this warranty. This warranty is in lieu of all other warranties expressed or implied.

Returning Defective Merchandise

If your TEKNOR product malfunctions, please do the following before returning any merchandise:

1) Call our Technical Support department in Canada at (450) 437-5682. Make certain you have the following at hand: the TEKNOR Invoice #, your Purchase Order #, and the Serial Number of the defective board.

2) Give the serial number found on the back of the board and explain the nature of your problem to a service technician.

3) If the problem cannot be solved over the telephone, the technician will further instruct you on the return procedure.

4) Prior to returning any merchandise, make certain you receive an RMA # from TEKNOR's Technical Support and clearly mark this number on the outside of the package you are returning. To request a number, follow these steps: make a copy of the request form on the following page, fill it out and fax it to us.

5) When returning goods, please include the name and telephone number of a person whom we can contact for further explanations if necessary. **Where applicable, always include all duty papers and invoice(s) associated with the item(s) in question.**

6) When returning a TEKNOR board:

   i) Make certain that the board is properly packed: Place it in an antistatic plastic bag and pack it in a rigid cardboard box.

   ii) Ship prepaid to (but not insured, since incoming units are insured by TEKNOR):

TEKNOR INDUSTRIAL COMPUTERS INC.

616 Cure Boivin
Boisbriand, Quebec
J7G 2A7 CANADA

TEKNOR
INDUSTRIAL COMPUTERS INC.

RETURN TO MANUFACTURER AUTORIZATION REQUEST

Contact Name: _____

Company Name: _____

Street Address: _____

City: _____ **Province / State:** _____

Country: _____ **Postal / Zip Code:** _____

Phone Number: _____ **Fax Number:** _____

Extension: _____

Serial Number	Failure or Problem Description	P.O. # (if not under warranty)

ref.: RMA-03

Fax this form to TEKNOR's Technical Support department in Canada at (450) 437-8053