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# VME-TB21

*Peripheral Transition Board*

## User's Manual

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## Document Information

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|---|---|---|---|
| 00 | dlb | 07-01-94 | Initial release |
| 01 | dlb | 02-06-96 | Minor correction |
| A0 | dlb | 06-03-96 | Update for board rev. A0 |
| B0 | jev | 11-17-99 | Update for board rev. B0 |
| B0 | jev | 5-15-2003 | Update for minor changes and current Logos |

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## Conventions

A number of conventions are used throughout this manual in order to provide clarity and accuracy. These include:

- The use of an 'H' suffix to a number indicates that the number is written in hexadecimal (base sixteen) notation.
- The use of a '-' (minus) suffix to a signal name indicates that it is an active low signal. The signal is either true when the signal is at a logic zero level or the signal initiates actions on a high-to-low transition.
- Text in `Courier` Font indicates a command entry or output from an SBS embedded PC product using its built-in character set.

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## General Description

The VME-TB21 transition board is a companion to SBS Technologies VME-2486, V5x, and PROx series Embedded PCs which provides a convenient means of connecting remotely-mounted floppy drives, hard drives, and other peripherals. The VME-TB21 routes the peripheral control signals supplied by the *a* and *c* rows of the Embedded PC's P2 connector to standardized connectors which are compatible with industry-standard signal definitions. The VME-TB21 simply plugs onto the back of the P2 backplane in the slot position occupied by the CPU card. Only the signals provided on P2 rows *a* and *c,* and power (+5V/GND) from row b are utilized by the TB21. The extended VMEbus signals on row *b* are not connected.

## Features

The VME-TB21 has a number of features which make it an excellent companion to SBS Embedded Computers VME-2486, V5x, and PROx Embedded PCs:

- Directly Plug Compatible with VME-2486, V5x, and PROx series
- Connection to Floppy, IDE and SCSI
- Provides P2 Peripheral Interface Connector for SBS Drive Modules

*NOTE: Power Connectors are not available on the VME-TB21.*

## Connector Locations

The location of each connector of the VME-TB21 is shown in Figure 1.

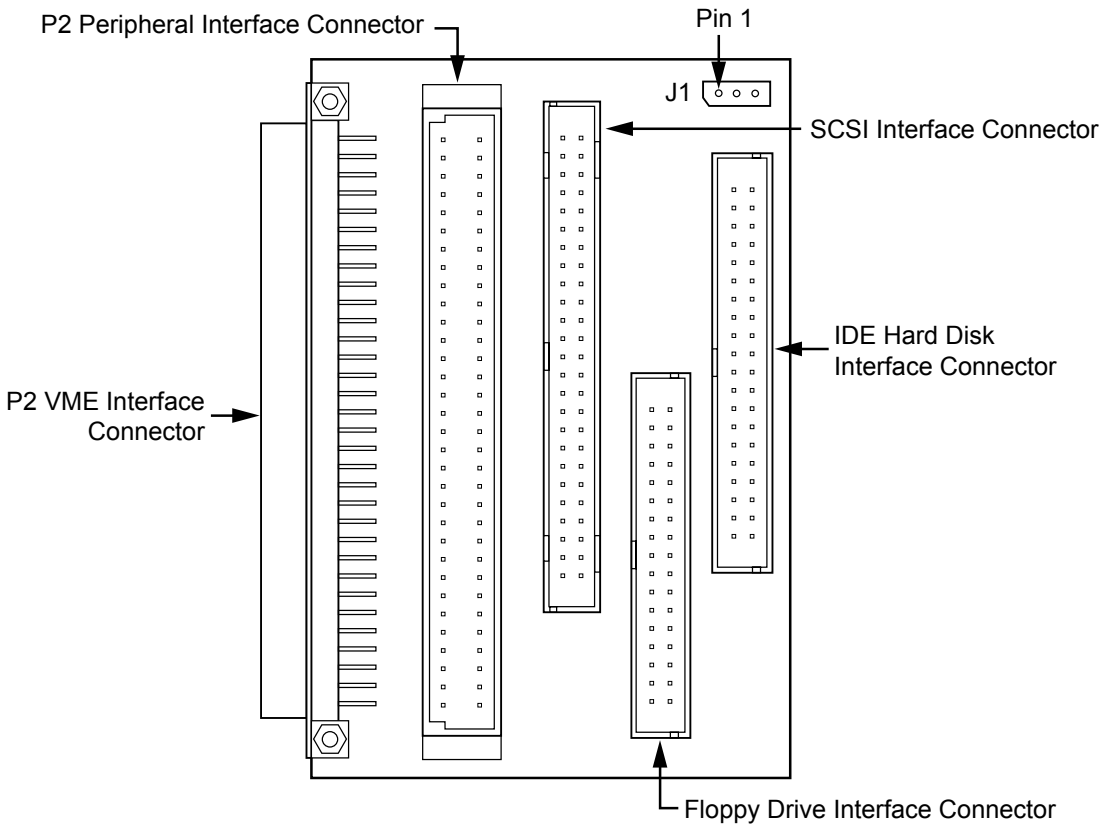



**Figure 1** Location of TB21 Connectors



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## P2 Peripheral Interface

The P2 peripheral interface is provided to a three-row eurocard socket connector labeled P1 which has the center row, row *b*, not installed. As such, it does not pass the extended VME signals found on P2 row b, but provides the SCSI, IDE, and floppy drive signals found on P2 rows *a* and *c*. With this interface, you can use a TB21 with your Embedded PC and still connect a SBS Technologies VME-6200 drive module.

Figure 2 shows the pin numbering of the connector. Table 1 shows the signals provided by the P2 peripheral interface.

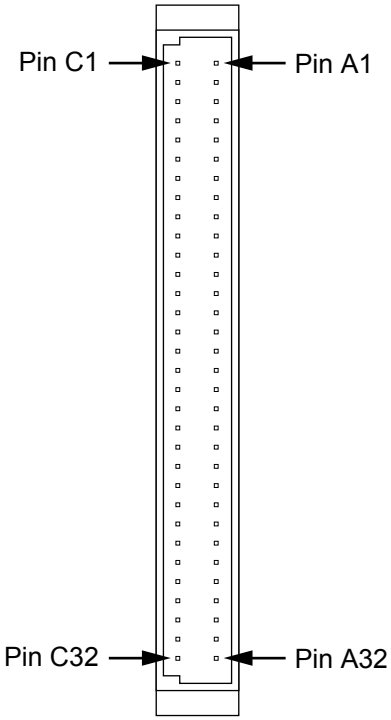



**Figure 2** P2 Peripheral Interface Connector Pin Locations



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| Pin Number | Row c Pin | Row a Pin |
|---|---|---|
| 1 | HDMACK- | DB0 |
| 2 | HD0 | DB1 |
| 3 | HD1 | DB2 |
| 4 | HD2 | DB3 |
| 5 | HD3 | DB4 |
| 6 | HD4 | DB5 |
| 7 | HD5 | DB6 |
| 8 | HD6 | DB7 |
| 9 | HD7 | PARITY- |
| 10 | HD8 | ATN- |
| 11 | HD9 | BSY- |
| 12 | HD10 | ACK- |
| 13 | HD11 | RST- |
| 14 | HD12 | MSG- |
| 15 | HD13 | SEL- |
| 16 | HD14 | C/D- |
| 17 | HD15 | REQ- |
| 18 | PDIAG | I/O- |
| 19 | HDIOW- | HSMARQ |
| 20 | HDIOR- | FRWC- |
| 21 | IOCHRDY | FINDEX- |
| 22 | HDALE | FMTO- |
| 23 | IRQ14 | FDS2- |
| 24 | IOCS16- | FDS1- |
| 25 | HDA0 | FMT1- |
| 26 | HDA1 | FDIRC- |
| 27 | HDA2 | FSTEP- |
| 28 | HCS0- | FWD- |
| 29 | HCS1- | FWE- |
| 30 | SLVACT- | FTK0- |
| 31 | FHS- | FWP- |
| 32 | FDSKCHG- | FRD- |

**Table 1** P2 Peripheral Interface Signals



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## Floppy Drive Interface

The floppy drive interface is provided to a 34-position male header connector (AMP part 103308-7 or equivalent) which will accept most standard floppy cable assemblies. The connector is labeled “FLOPPY” on the TB21 silkscreen and is component P3. Figure 3 shows the pin numbering of the connector. Table 2 shows the signals provided by the floppy interface.

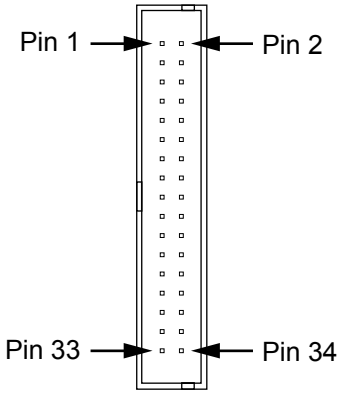



**Figure 3** Floppy Interface Connector Pin Locations

| P3 Pin | Signal | Direction | Signal Description |
|---|---|---|---|
| Odd | GND | | Signal Ground |
| 2 | FRWC- | To Drive | Read/Write Control |
| 4 | NC | | Not Connected - Unused |
| 6 | NC | | Not Connected - Unused |
| 8 | FINDEX- | From Drive | Index Mark Detected |
| 10 | FMT0- | To Drive | Motor On 0 |
| 12 | FDS2- | To Drive | Drive Select 2 |
| 14 | FDS1- | To Drive | Drive Select 1 |
| 16 | FMT1- | To Drive | Motor Control 1 |
| 18 | FDIRC- | To Drive | Step Motor Direction Control |
| 20 | FSTEP- | To Drive | Motor Step Control |
| 22 | FWD- | To Drive | Write Data |
| 24 | FWE- | To Drive | Write Enable |
| 26 | FTK0- | From Drive | Track 0 Position |
| 28 | FWP- | From Drive | Floppy is Write Protected |
| 30 | FRD- | From Drive | Read Data |
| 32 | FHS- | To Drive | Head (Side) Select |
| 34 | FDSKCHG- | From Drive | Disk Change Indicator |

**Table 2** Floppy Drive Interface Signals



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## SCSI Interface

The SCSI hard disk interface is provided by a 50-position male header connector which will accept most standard SCSI drive ribbon cable assemblies. This connector is labeled P4 and Figure 4 shows the pin locations of the connector. The signals provided by the SCSI interface are shown in Table 3.

Note: Termination power is provided by the TB21 if the TB21 is being supplied power via the power supply connector.

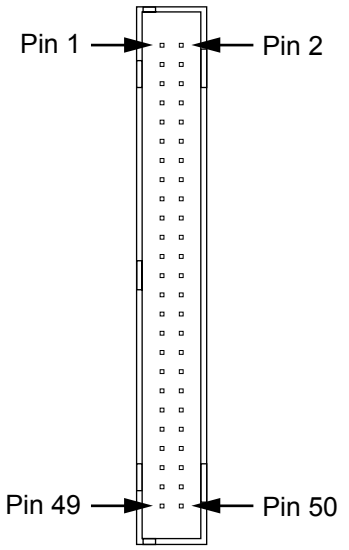



**Figure 4** SCSI Connector Pin Locations



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| P4 Pin | Signal | Signal Description |
|---|---|---|
| Odd #s | GND | Signal Ground |
| 2 | SC0- | Data Bit 0 |
| 4 | SC1- | Data Bit 1 |
| 6 | SC2- | Data Bit 2 |
| 8 | SC3- | Data Bit 3 |
| 10 | SC4- | Data Bit 4 |
| 12 | SC5- | Data Bit 5 |
| 14 | SC6- | Data Bit 6 |
| 16 | SC7- | Data Bit 7 |
| 18 | SPAR- | Data Bus Parity |
| 20 | GND | Signal Ground |
| 22 | GND | Signal Ground |
| 24 | GND | Signal Ground |
| 26 | TRMPWR | Terminator Power* |
| 28 | GND | Signal Ground |
| 30 | GND | Signal Ground |
| 32 | ATN- | Attention |
| 34 | GND | Signal Ground |
| 36 | SBSY- | SCSI Bus Busy |
| 38 | SACK- | Acknowledge |
| 40 | SRST- | SCSI Bus Reset |
| 42 | SMSG- | Message |
| 44 | SSEL- | Select |
| 46 | SCD- | Command/Data |
| 48 | SREQ- | Request |
| 50 | SIO- | Input/Output Data Direction |

**Table 3** SCSI Interface Signals

## IDE Drive Interface

The IDE hard drive interface is provided to a 40-position male header connector (AMP part 103308-8 or equivalent) which will accept most standard IDE cable assemblies. This connector is labeled P5 and Figure 5 shows the pin locations of the connector. The IDE hard drive interface provides the signals shown in Table 4.

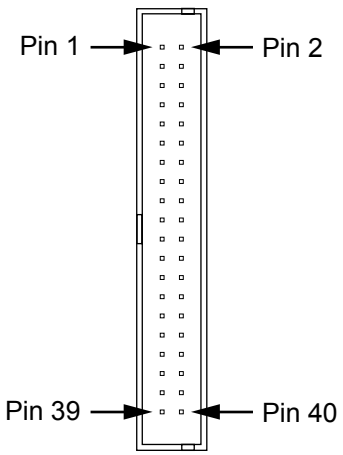



**Figure 5** IDE Interface Connector Pin Locations



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| P5 Pin | Signal | Direction | Signal Description |
|---|---|---|---|
| 1 | HDRESET- | To Drive | Drive Reset |
| 2 | GND | | Signal Ground |
| 3 | HD07 | Bidirectional | Disk Data Bit 7 |
| 4 | HD08 | Bidirectional | Disk Data Bit 8 |
| 5 | HD06 | Bidirectional | Disk Data Bit 6 |
| 6 | HD09 | Bidirectional | Disk Data Bit 9 |
| 7 | HD05 | Bidirectional | Disk Data Bit 5 |
| 8 | HD10 | Bidirectional | Disk Data Bit 10 |
| 9 | HD04 | Bidirectional | Disk Data Bit 4 |
| 10 | HD11 | Bidirectional | Disk Data Bit 11 |
| 11 | HD03 | Bidirectional | Disk Data Bit 3 |
| 12 | HD12 | Bidirectional | Disk Data Bit 12 |
| 13 | HD02 | Bidirectional | Disk Data Bit 2 |
| 14 | HD13 | Bidirectional | Disk Data Bit 13 |
| 15 | HD01 | Bidirectional | Disk Data Bit 1 |
| 16 | HD14 | Bidirectional | Disk Data Bit 14 |
| 17 | HD00 | Bidirectional | Disk Data Bit 0 |
| 18 | HD15 | Bidirectional | Disk Data Bit 15 |
| 19 | GND | | Signal Ground |
| 20 | KEY | | Keying Pin Position |
| 21 | HDMARQ | From Drive | DMA Request |
| 22 | GND | | Signal Ground |
| 23 | HDIOW- | To Drive | Drive I/O Write |
| 24 | GND | | Signal Ground |
| 25 | HDIOR- | To Drive | Drive I/O Read |
| 26 | GND | | Signal Ground |
| 27 | IOCHRDY | From Drive | I/O Channel Ready |
| 28 | HDALE | To Drive | Address Latch Enable |
| 29 | HDMACK- | To Drive | DMA Acknowledge |
| 30 | GND | | Signal Ground |
| 31 | HDIRQ | From Drive | Interrupt Request |
| 32 | HDIOCS16 | To Drive | I/O Channel Select 16 |
| 33 | HDA1 | To Drive | Address Line 1 |
| 34 | PDIAG- | Bidirectional | Passed Diagnostics |
| 35 | HDA0 | To Drive | Address Line 0 |
| 36 | HDA2 | To Drive | Address Line 2 |
| 37 | HCS0- | To Drive | Chip Select 0 |
| 38 | HCS1- | To Drive | Chip Select 1 |
| 39 | SLVACT- | To Drive | Slave Active |
| 40 | GND | | Signal Ground |

**Table 4** IDE Drive Interface Signals



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## Installation

The VME-TB21 can be installed into a VME-system by simply plugging the P2 connector of the TB21 onto the wire wrap pins or transition connector of most VMEbus P2 backplanes in the slot position of the host CPU board. Once installed, the VME-TB21 extends a maximum of 3 inches behind the P2 backplane mating connectors. Even with the disk drive signal and power connectors installed, the VME-TB21 occupies only one VMEbus slot width (4HP) and will not interfere with adjacent transition boards. To prevent exerting unecessary force on the TB21, it is recommended that you connect all peripherals to the TB21 before plugging it into the backplane.

***NOTE:*** *Ji should never be installed.*

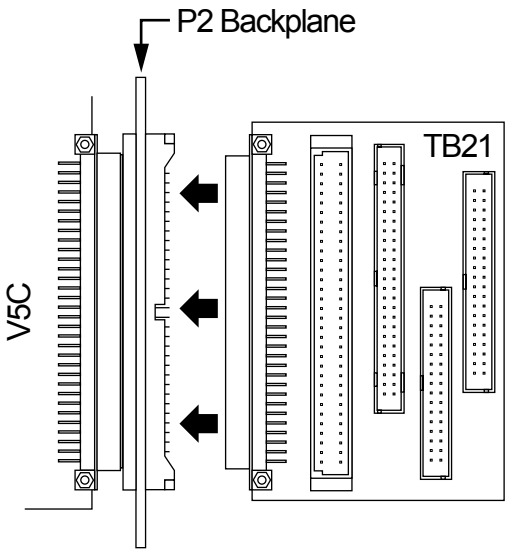



**Figure 8** TB21 Installation

## Specifications

| | | |
|---|---|---|
| **General** | ***Model*** | VME-TB21 |
| | ***Description*** | Peripheral Transition Board |
| | ***Host Compatibility*** | VME-2486, V5x and PROx |
| **Electrical** | ***Power*** | +5V, 400mA max. SCSI termination power |
| **Physical** | ***Size*** | 3.9" x 3.2" Overall |
| **Environmental** | ***Temperature*** | 0 to 55° Celsius Inlet Air, Operating<br>-40 to 85° Celsius, Non-Operating |
| | ***Cooling*** | None |
| | ***Humidity*** | 10 to 90% RH, Non-Condensing |
| | ***Shock*** | 6G Max. Operating, 10G Max. Non-Operating |



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