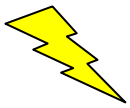
Users Manual
VBT100

Proper Handling Precautions



This product uses components that are sensitive to Electrostatic Discharge (ESD). While the VBT100 is not in use, it should be stored in its protective ESD bag inside the carrying case provided. Remove the VBT100 from its protective package only at a grounded workstation while wearing an approved grounding wrist strap.

Safety Precautions and Equipment Limitations

To avoid fire or personal injury:

Use proper external power supply. To avoid fire or shock hazard, power to product should only be provided via the VME backplane voltage or the supplied desktop power supply.

Only handle product by front panel handles. Since the product may be powered outside the VME backplane or hot swapped into the VME backplane, a shock may occur if contact is made with any side other than the front panel while power is applied.

Avoid If external power is used, external power should be applied after module has been connected to the VME backplane.

Do not operate with suspected failures. If you suspect there is damage to this product, have it inspected by qualified service personnel.

Do not operate in wet/damp conditions.

Do not operate in an explosive atmosphere.

Keep product surfaces clean and dry.

Do not exceed the maximum voltage rating. Should a voltage greater than +/-40 Vdc come into contact with either of the P1 or P2 connectors damage will occur.

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1.0 Product Overview

The VBT100 (VME Backplane Tester) plugs into a VME or VME64x backplane and performs a series of tests that verify the integrity and safe operation of the backplane. These tests check for intrusive voltages, correct power supply voltages, signal shorts / opens and proper impedance. The tester is a single plug-in 6U VME board that operates in both empty and fully loaded backplanes with or without power.

The VBT100 has been designed to withstand and measure excessive voltages on both signal and power supply pins. This capability allows it to operate in faulty backplanes that could damage other boards. The tester also detects, measures and identifies which signals have excessive voltages so they can be repaired before boards are loaded into a backplane.

Other tests verify that the backplane is within specification insuring other VME boards will operate properly. The VBT100 continually monitors and measures the power supply voltages and displays out of range conditions. A short test checks all signals for shorts to other signals, power and ground. An open test verifies the proper connection of bussed signals. This test also checks for proper backplane terminations and identifies missing pullup and pulldown resistors. Impedance testing detects high and low impedance conditions that could effect backplane operation.

The front panel display and control switches allow the VBT100 to operate as a self contained unit. All tests are initiated by toggling a front panel test switch. The test results are stored in a buffer and displayed on the 24 character alphanumeric LED readout controlled by a scroll pushbutton. During testing information regarding the progress of a test is also displayed.

2.0 Features

2.1 General Features

- Quickly identifies unsafe and out of specification VME backplanes
- Checks all VME and VME64x signals
- Withstands +40Vdc to –40Vdc on any signal
- Detects high voltages that may damage cards
- Identifies open or shorted signals
- Detects improper terminations
- Checks signal impedance
- Continuously measures power supply voltages
- Power supply LEDs illuminate Green if within spec or Red for out of spec
- All tests and results are displayed on a 24 character alphanumeric LED display
- Tests are initiated and results are read using front panel switches
- Signal names and connector pin assignments are identified during and after testing
- Choice of quick or comprehensive tests
- Results are stored for review
- Tests both powered and un-powered backplanes
- Works with other boards in backplane
- Hot Swap capable
- Operates on backplane or external power
- Feature upgrades through JTAG interface
- Low power consumption

2.2 Test Features

Power Supply Test

- Continuously Measures +5V, +12V, -12V supplies
- Also measures +3.3V, +5VSTBY, VPC, +/-V1, +/-V2
- Accuracy +/- 10mv
- Displays measured voltages
- Indicates a failure if out of range
- LED monitor of +5V, +12V and –12V supplies

Intrusive Voltage Test

- Detects voltages which may cause damage to boards
- Measures and displays intrusive voltages
- Alerts user to fix intrusive voltage
- Measurement of +40Vdc to –40Vdc voltages
- Accuracy +/- 40mv

Short Test

- Checks for shorts between signals
- Checks for signal shorts to power and ground
- Detects resistive shorts and hard shorts
- Displays shorted signal connector pins

Open Test

- Checks for open signals on backplane
- Detects improper terminations
- Identifies missing pullup and pulldown resistors
- Displays signal names and connector pins

Impedance Test

- Checks signals for proper resistive impedance
- Detects high and low impedance
- Displays out of tolerance signals and connector pins
- Identifies excessive capacitive signal loads

3.0 Operation

3.1 Front Panel Controls and Display

3.1.1 LED Voltage Monitors (-12V, +12V, +5V)
Bi-color LEDs indicate proper +5V, +12V and -12V power supply voltages. These LEDs illuminate GREEN if a power supply voltage is within specification and RED if not.
+5V range: 4.875V to 5.25V
+12V range: 11.64V to 12.60V
-12V range: -11.64V to -12.60V

3.1.2 Ready LED Indicator (RDY)
The ready indicator is illuminated GREEN when the VBT100 is idle and flashes when it is busy performing a test.

3.1.3 Power Indicator LED (PWR)
The power indicator illuminates GREEN when the VBT100 is powered either by the bus or externally.

3.1.4 Test Selection Switch (A B)
Testing is initiated by pressing the A-B test toggle switch. This switch has a center OFF position and momentary ON position on either side. Toggling the switch towards the A side starts the series of A tests and toggling the switch towards the B side starts the series of B tests.

3.1.5 Results Display (DISPLAY)
This 24 character alphanumeric LED display shows the progress and results of testing.

3.1.6 Results Scroll Pushbutton (SCROLL)
This momentary pushbutton switch controls the display of test results. When a series of tests have completed the results can be reviewed by pressing or holding the scroll button. Holding the button provides a continuous scroll of results at a fixed interval.

3.1.7 External Power Connector (EXT PWR)
Power can be supplied to the VBT100 through this 2 pin power connector. A desktop power supply is included with the tester. The power selection switch must be in the EXT position for the VBT100 to use the external power. The acceptable operating voltage range is 3V to 12V and it is protected from -40V to +40V.

3.1.8 Power Selection Switch (SW3)
This switch routes power to the VBT100 from either the VME bus or an external power supply through the front panel power connector. The bus power uses the +5V power pins on the P1 connector. In addition to switching power to the tester, the ground connection is also switched to provide complete isolation between the bus and the external supply. The selected power source is also isolated on board through an isolated DC to DC converter.

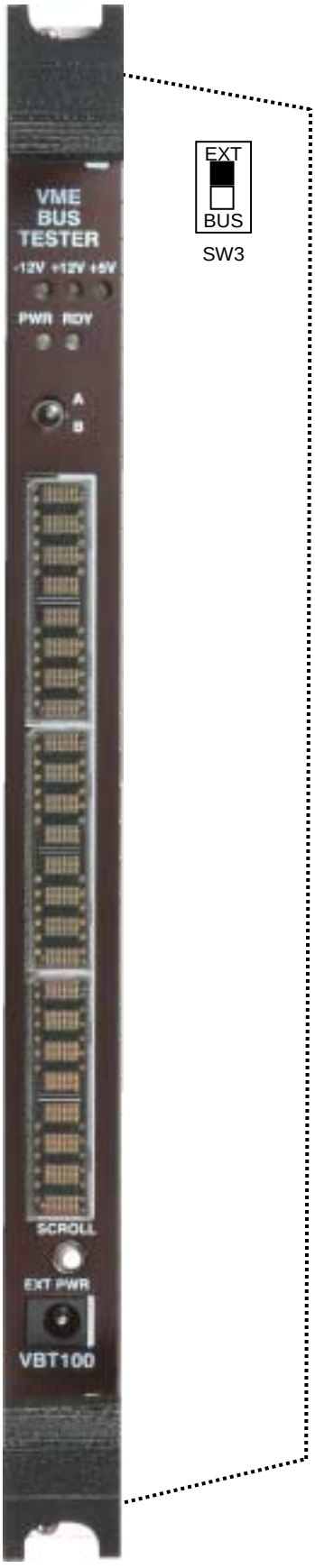

Figure 1 – Front Panel

3.2 Installation

The VBT100 can be inserted into any VME backplane slot. The tester is hot swap capable allowing it to be plugged into a live backplane.

There are no jumpers to configure or cables required for installation. There is an option to power the VBT100 externally instead of using backplane power. In this case an external desktop power supply is provided that plugs into the EXT PWR front panel connector. A switch (SW3) located on the tester selects between bus and external power. See figure 1 for the power selector switch location.

3.3 Initialization

When power is applied to the tester VBT hardware is initialized, analog channels are self calibrated, power supply voltages are checked, the geographical address is read and a self test is performed. The following flowchart describes the initialization sequence.

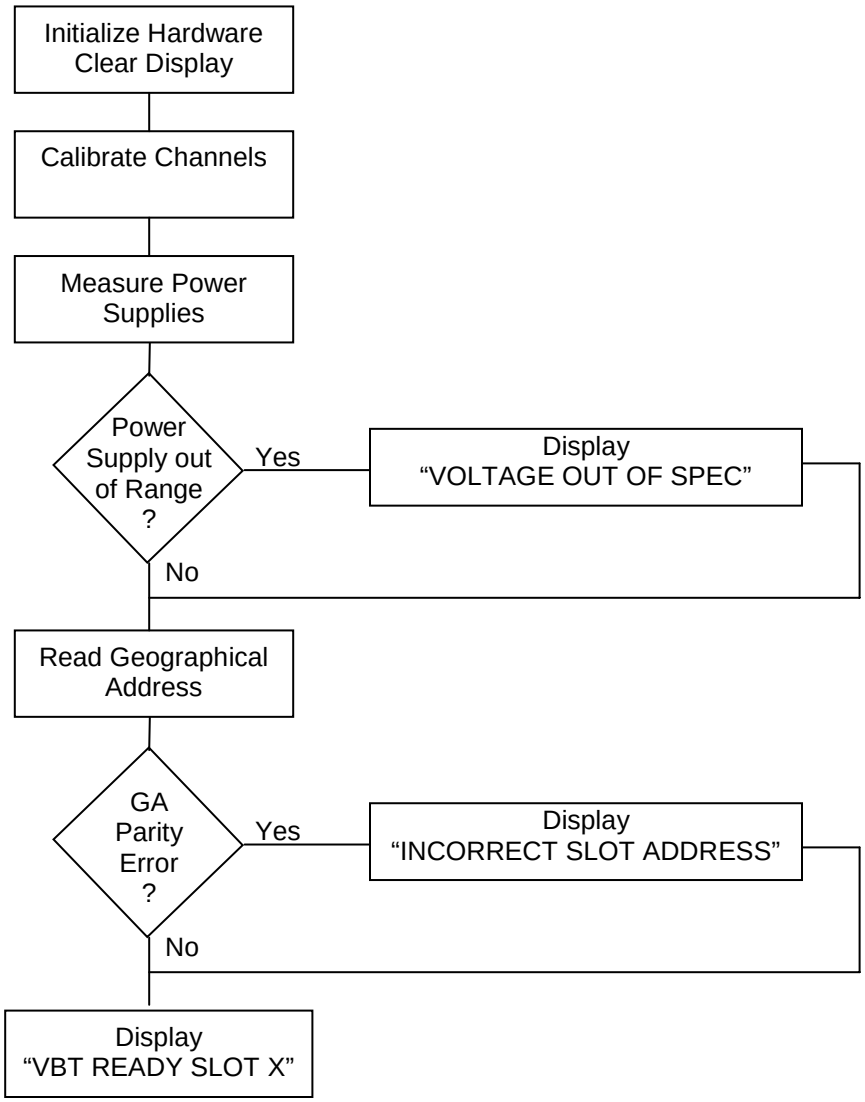

Figure 2 – Initialization Sequence Flowchart

3.4 Test Initiation, Selection and Sequencing

Testing is initiated by pressing the A-B test toggle switch. This switch has a center OFF position and momentary ON position on either side. Toggling the switch towards the A side starts the series of A tests and toggling the switch towards the B side starts the series of B tests.

3.4.1 A Tests

The A selection initiates two of the VBT100 tests which include the Power Supply and Intrusive Voltage tests. These check for safe operation of the backplane. These tests can be used to insure that there are no harmful voltages that could damage boards before they are inserted into the backplane.

Although this test can be performed in any system configuration, it is recommended that the VBT be inserted into a powered VME backplane with no other boards. This configuration allows the VBT100 to test the backplane power supplies and signals for excessive voltages before other boards are inserted and damaged in a faulty backplane. The A tests are a subset of the B tests.

3.4.2 B Tests

The B selection initiates all of the VBT100 tests which include the Power Supply, Intrusive Voltage, Short, Open and Impedance tests. These check for safe operation and backplane integrity. The B tests provide a complete check of the backplane to insure that other boards will operate properly. The B tests can be performed in any system configuration including powered and un-powered backplanes with or without boards.

In a running system where there is backplane activity the VBT100 will drive Bus Request 3 (BR3*) active then drive Busy (BBSY*) active and hold the backplane reset (SYSRESET*) during the Short, Open and Impedance tests.

When the backplane is not powered a message “Dead System”, “Remove All Boards”, “Select B to Continue” will be displayed after the Intrusive Voltage test is run.

A Tests	B Tests
Power Supply	Power Supply
Intrusive Voltage	Intrusive Voltage
	Short
	Open
	Impedance

3.4.3 Test Sequence

After the initialization sequence the VBT100 is ready to start testing. Toggling the test switch starts the sequence which is described in the flowchart in figure 3.

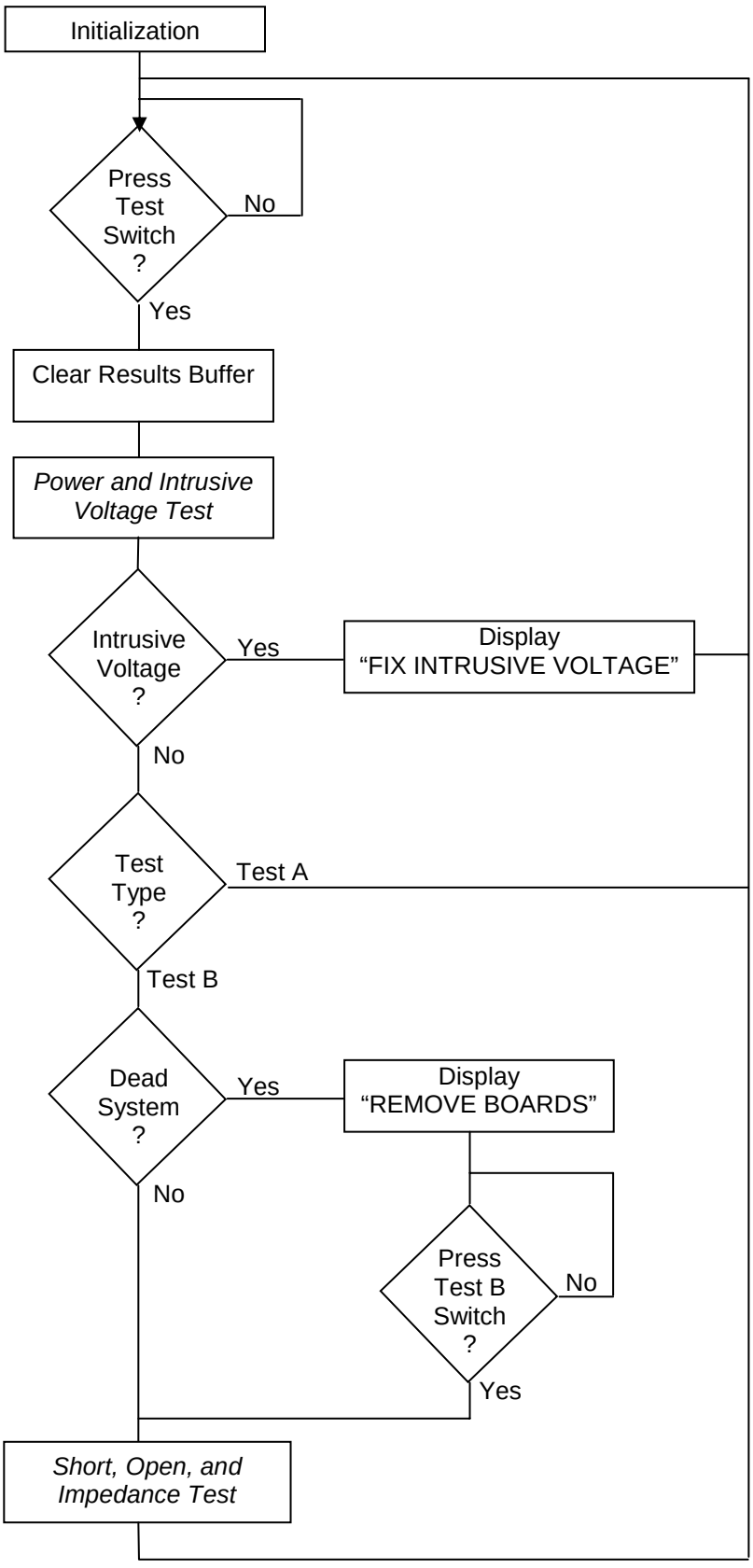

Figure 3 – Test Sequence Flowchart

3.4.4 Removal

After testing is completed, the VBT100 may be removed while it or the system is powered, since it is hot swap capable. However for safety reasons, the preferred state is to remove external power if used by unplugging the external power supply from the AC (wall) outlet. System power may remain on as long as the circuit card is ejected and handled by the handles and front panel. All ESD precautions should be observed.

3.5 Testing

The VBT100 is ready to start testing when the following message is displayed.

```
VBT READY          SLOT 1
```

In a VME64x backplane the slot number (geographical address) is identified. Toggle the A-B test selection switch to start testing.

3.5.1 Power Supply Test (test time 5 sec.)

The power supply test measures the voltages on the VME backplane and tests to determine if these are within the following specified ranges.

Power Supply	Low Range	High Range
+5V	+4.875V	+5.25V
+12V	+11.64V	+12.60V
-12V	-12.60V	-11.64V

When this test is running the following message is displayed:

```
POWER SUPPLY TEST      RUN
```

As a power supply voltage is measured the name and measured voltage is displayed. If the voltage is within an acceptable range a PASS is indicated. If the voltage is outside this range a FAIL is indicated.

```
+12V      PASS          +12.03V
```

At the end of this test a summary is displayed. If all of the individual tests pass then a PASS is indicated for the entire group. If any test fails a FAIL is indicated for the entire group.

```
POWER SUPPLY TEST      PASS
```

The results of these tests are stored in a buffer for later review using the scroll pushbutton.

3.5.2 Intrusive Voltage Test (test time 8 sec.)

The Intrusive Voltage test measures the voltages on the VME backplane signals to determine if there are excessive voltages that could damage other boards.

When this test is running the following message is displayed.

```
INTRUSIVE VOLTAGE        RUN
```

As a voltage is measured the signal name is displayed.

```
INTRUSIVE VOLTAGE       DTACK
```

At the end of this test a summary is displayed. If all of the individual tests pass then a PASS is indicated for the entire group. If any test fails a FAIL is indicated for the entire group.

```
INTRUSIVE VOLTAGE       PASS
```

The results of these tests are stored in a buffer for later review using the scroll pushbutton.

If an intrusive voltage is found on any signal the following message is displayed and testing stops.

```
FIX INTRUSIVE VOLTAGE!
```

If Test A is selected testing stops and results can be viewed. If Test B is selected additional tests will be run. The following message is displayed in an un-powered backplane before proceeding to run additional tests. The test B switch must be toggled to continue.

```
DEAD SYSTEM DETECTED
```

```
REMOVE POWER AND CARDS
```

```
SELECT TEST B TO CONT.
```

3.5.3 Short Test (test time 50 sec.)

The Short test checks VME backplane signals to determine if there are any shorts to other signals, power or ground. The VBT100 performs this test by generating a narrow pulse on the test signal and monitoring the other signals for a similar pulse. If a similar pulse is detected on another signal it is considered shorted to the test signal. If a pulse can not be driven onto the test signal the voltage is measured and determined to be a power short if greater then 4.75V and shorted to ground if less then 0.25V.

When this test is running the following message is displayed.

```
SHORT TEST                RUN
```

As a signal is checked the signal name is displayed.

```
SHORT TEST                A30
```

At the end of this test a summary is displayed. If all of the individual tests pass then a PASS is indicated for the entire group. If any test fails a FAIL is indicated for the entire group.

```
SHORT TEST                PASS
```

The results of these tests are stored in a buffer for later review using the scroll pushbutton.

3.5.4 Open Test (test time 8 sec.)

The Open test checks VME backplane signals to determine if there are any open traces or missing backplane termination resistors. The VBT100 performs this test by measuring the voltage on a signal under various load conditions. A failure can be identified by comparing the voltage measured under different conditions with a preset table of values that identify the fault. If the test is performed on a backplane without power the VBT100 has the ability to drive the test signal.

When this test is running the following message is displayed.

```
OPEN TEST                    RUN
```

As a signal is checked the signal name is displayed.

```
OPEN TEST                    AM4
```

At the end of this test a summary is displayed. If all of the individual tests pass then a PASS is indicated for the entire group. If any test fails a FAIL is indicated for the entire group.

```
OPEN TEST                    PASS
```

The results of these tests are stored in a buffer for later review using the scroll pushbutton.

3.5.5 Impedance Test (test time 5 sec.)

The Impedance test checks VME backplane signals to determine if there is any DC loading of a signal. The VBT100 can identify high or low impedance of a signal by performing an accurate voltage measurement under load conditions and comparing this with a normal average impedance value of all the signals on the backplane.

When this test is running the following message is displayed.

```
IMPEDANCE TEST          RUN
```

As a signal is checked the signal name is displayed.

```
IMPEDANCE TEST         LWORD
```

At the end of this test a summary is displayed. If all of the individual tests pass then a PASS is indicated for the entire group. If any test fails a FAIL is indicated for the entire group.

```
IMPEDANCE TEST          PASS
```

The results of these tests are stored in a buffer for later review using the scroll pushbutton.

3.5.6 Test Completion Messages

After all tests are complete the following messages are displayed:

```
ALL A TESTS PASSED
BACKPLANE SAFE
```

If all A tests pass.

```
ALL B TESTS PASSED
BACKPLANE GOOD
```

If all B tests pass.

```
TESTS FAILED          PUSH---->
```

If any A or B tests failed. Push the results pushbutton to display the test results.

3.6 Results

The detailed results of each test are stored in a results buffer that can be viewed after the tests complete. The results can be reviewed by pressing or holding the scroll button. Holding the button provides a continuous scroll of results at a fixed interval.

This section shows the results that are displayed after pressing the scroll pushbutton.

`VBT TEST RESULTS`	Start of results display.

3.6.1 Power Supply Results

`POWER SUPPLY TEST FAIL`	A test summary displays the name of the test and PASS if all of the tests pass or FAIL if one or more tests fail.
`+5V PASSED +5.03`	The +5V power supply voltage is displayed and PASSED is indicated if within an acceptable range or FAILED if outside this range.
`+12V PASSED +12.10`	The +12V power supply voltage is displayed and PASSED is indicated if within an acceptable range or FAILED if outside this range.
`-12V FAILED -11.20`	The -12V power supply voltage is displayed and PASSED is indicated if within an acceptable range or FAILED if outside this range.

3.6.2 Intrusive Voltage Results

`INTRUSIVE VOLTAGE FAIL`	A test summary displays the name of the test and PASS if all of the tests pass or FAIL if one or more tests fail.
`NUMBER OF FAILURES 0001`	The number of failures for this test is displayed followed by the actual failures.
`A01 P1A30 -11.20`	The signal name, connector pin assignment and intrusive voltage is displayed.

3.6.3 Short Test Results

A test summary displays the name of the test and PASS if all of the tests pass or FAIL if one or more tests fail.

The number of failures for this test is displayed followed by the actual failures.

The connector pin assignments of the shorted signals are displayed.

The connector pin assignment of the shorted signal to ground or power is displayed.

3.6.4 Open Test Results

A test summary displays the name of the test and PASS if all of the tests pass or FAIL if one or more tests fail.

The number of failures for this test is displayed followed by the actual failures.

The signal name, connector pin assignment and open failure is displayed.

Possible failures displayed are:

-1UP	missing 1 pullup
-1DN	missing 1 pulldown
-1UP -1DN	missing 1 pullup and 1 pulldown
-2UP	missing 2 pullups
-2DN	missing 2 pulldowns
-1UP -2DN	missing 1 pullup and 2 pulldowns
-2UP -1DN	missing 2 pullups and 1 pulldown
NO TERM	missing 2 pullups and 2 pulldowns

3.6.5 Impedance Test Results

A test summary displays the name of the test and PASS if all of the tests pass or FAIL if one or more tests fail.

The number of failures for this test is displayed followed by the actual failures.

The signal name, connector pin assignment and impedance test result is displayed.

The signal name, connector pin assignment and impedance test result is displayed.

3.7 Special Test Cases

A number of signals are treated as special cases during testing.

Signal	Special Case
IACK	In slot 1 of a typical backplane the IACK signal is normally connected to the IACKI signal. The VBT100 will not show this as a short if it is plugged into slot number 1.
SYSCLK	If not active perform all tests on this signal. If it is active then only perform Intrusive Voltage test. In a dead system perform all tests.
SYSFAIL	This signal can be driven low by the system under test. In a powered backplane only perform Intrusive Voltage test. In a dead system perform all tests on this signal.
ACFAIL	This signal can be driven by the system under test. In a powered backplane only perform Intrusive Voltage test. In a dead system perform all tests on this signal.
SYSRESET	This signal can be driven by the system under test. In a powered backplane only perform Intrusive Voltage test. In a dead system perform all tests on this signal.
BGxIN, IACKIN	These daisy chain signals may be driven high by the system under test. If high the VBT100 will only perform an Intrusive Voltage test on these signals. If they are not high the VBT100 will also perform a short test.

3.8 Voltage Monitoring

The VBT100 continuously monitors the +5V, +12V and -12V backplane power supplies. Dedicated hardware consisting of analog comparators and precision voltage references detect if a supply is within an acceptable window. If a supply is within an acceptable range its corresponding front panel LED illuminates GREEN. If the supply is outside this range it illuminates RED.

In addition to the front panel LED monitor indicating an out of range power supply condition a message is displayed that shows the power supply that is faulty and the measured voltage. This message will appear only once even though the supply may drift in and out of range.

```
-12V OUT OF SPEC        -10.05
```

3.9 Programming

The VBT100 can be updated in the field through its on-board JTAG interface or by replacing the socketed Flash memory device.

3.9.1 JTAG Programming Interface

The VBT can be updated with new configuration data through its JTAG interface. This firmware contains FPGA code and mixed signal array configuration data that is stored in a Flash memory device on the VBT100. The JTAG connector is a 14 pin dual row 2.0mm IDC type connector. The pin assignments are as follows:

signal	pin	pin	signal
GND	1	2	+3.3V
GND	3	4	TMS
GND	5	6	TCK
GND	7	8	TDO
GND	9	10	TDI
GND	11	12	N/C
GND	13	14	N/C

3.9.2 Flash Device Programming

The memory device that contains the VBT100 configuration data is a 4Mb Flash memory in a 44 pin PLCC package. This part is in a socket allowing it to be removed and programmed without using the on-board JTAG interface. This feature allows the VBT100 to be updated without having a JTAG programmer on site. A new programmed Flash part can be shipped to the site and inserted into the memory socket on the VBT100.

4.0 Hardware Implementation

This section describes the basic circuit design of the VME Backplane Tester (VBT100). An explanation is given that relates the VBT hardware and its operation. The following block diagram depicts the main functional sections of the hardware. This diagram is referenced in the following sub-sections.

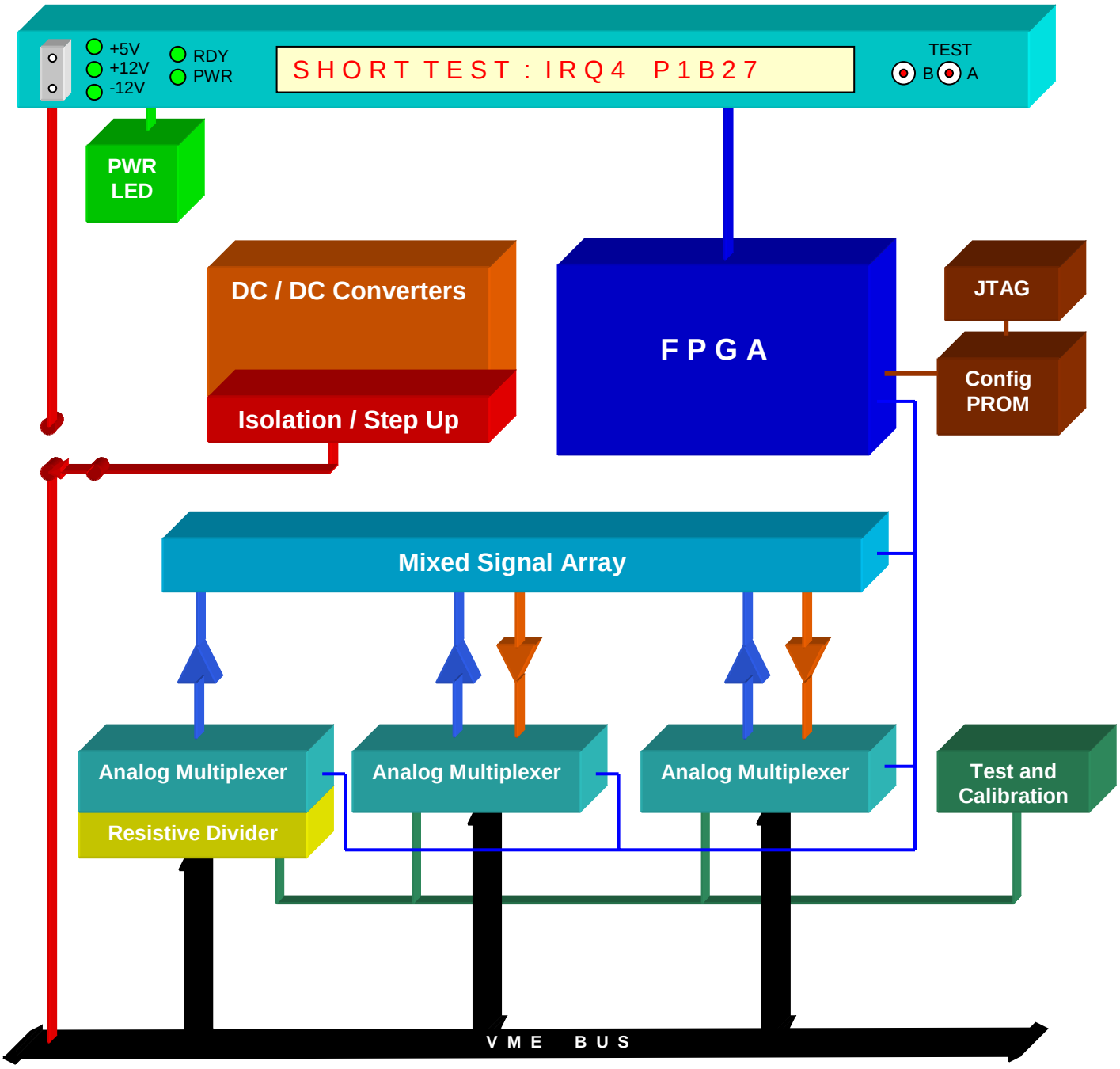

Figure 4 – VBT100 Block Diagram

4.1 General

Signals and power are routed through analog multiplexers to measurement and driver hardware. Voltage measurements are taken under various conditions and loads to determine if all backplane signals are within the VME bus specification. The user controls and reads the results of these tests through a front panel display and switches.

4.2 Input Section

Three analog multiplexer channels are available for signal selection. Channel 1 and 2 have the capability to drive and monitor signals directly at low levels. Channel 3 has the capability to monitor high voltage signals through a high impedance resistive divider. These multiplexers are fault protected and can withstand a continuous voltage on their inputs from -40V to +55V. The output of the multiplexer is limited to the supply rails for the part protecting the internal VBT hardware. Signals are routed through all 3 channels. Power pins are also routed through channel 3 for measurement.

Before the selected signal is passed on for measurement it is buffered by a high impedance unity gain amplifier. This minimizes the effect of the on resistance of the analog switch. Buffers are also provided to drive signals through channel 1 and 2.

4.2 Test and Calibration

A number of precision test signals are also routed through all 3 channels. These are selected to calibrate and test the VBT. Calibration allows the VBT to compensate for the analog multiplexers part to part and temperature on resistance variation. Some of the test signals provide the same terminations seen on the VME backplane.

The test signals are also provided to enable a complete end to end self test of the VBT. During self test the VBT checks to insure it is functioning properly. These tests check the analog multiplexers, measurement / drive hardware and control.

4.4 Analog Measurement and Driver Hardware

The VBT measurement hardware is based on a mixed signal array which contains A/D converters, D/A converters, comparators, buffers, analog drivers, amplifiers, oscillators and filters. Selected signals are routed to the mixed signal array for measurement or to be driven. The results of the measurements are passed to the control FPGA.

4.5 VBT Control

An FPGA controls the operation of the VBT including the user interface display and control, test sequencing, analog multiplexer signal selection, measurement tests and self test. At power up the FPGA configuration is loaded by a configuration PROM. This PROM is programmed through a JTAG interface.

4.6 Power Supply

Power to the VBT is supplied by either the VME backplane or an external source thru a front panel power connector. The input power and ground is electrically isolated from the VME backplane and operates within a wide range of input voltages.

The input power is selected thru on board jumpers and drives a step up DC/DC converter with an input range of +3.0V to +12.0V and fixed output of +12V. The output of this stage feeds a fully isolated DC/DC converter which feeds a number of other DC/DC converters that provide the VBT hardware with positive and negative voltages.

4.7 Front Panel Display and Control

A 24 character LED front panel display shows the status and results of the tests being performed. A pushbutton and toggle switch control the test sequence and scrolling of test results. Three LEDs display the status of the +5V, +12V and -12V power supplies indicating out of spec voltages in red and in spec voltages in green. Comparators are implemented with resistive dividers that set the high and low limits of these voltage ranges. A Ready LED flashes when the VBT is busy and a Power LED indicates that power is supplied to the VBT. The front panel also has a power connector for supplying external to the VBT.

4.8 Test Sequences

The following section describes the operation of the hardware for each VBT test.

4.8.1 Power Supply Test
All power supply voltages are selected by the channel 3 analog multiplexer. A resistive divider reduces the voltage so it is in an acceptable range to pass through the analog multiplexer. The selected voltage is buffered and the voltage translated for the input of the A/D converter. A voltage range of -40V to +40V can be measured with accuracy. The actual voltage is displayed on the front panel.

4.8.2 Intrusive Voltage
This test is similar to the power supply test except that all signals are tested for intrusive voltages. The channel 3 multiplexer is first used to check for high voltages. If the voltage is not within an acceptable range the signal and its voltage is displayed. If a signal is within an acceptable voltage the channel 1 or channel 2 multiplexer can be used to obtain a more accurate measurement. . A voltage range of -40V to +40V can be measured with accuracy. The actual voltage is displayed on the front panel.

4.8.3 Short Test
These tests make use of the channel 1 and channel 2 multiplexers. One channel is used to drive a stimulus on an individual signal while the other channel checks if the stimulus is present on another signal. If a short is detected a short indication and the names of the signals are displayed.

4.8.4 Open Test
A measurement of the voltage on the selected signal is used to determine if an open condition is present. This test uses the fact that the signal is terminated at both ends of the backplane. This test also can determine if a termination resistor is faulty or missing by switching in a load. Channel 1 is used to measure the voltage of the test signal. A load is then applied on channel 2 and the voltage is measured again to determine proper backplane terminations. If an open is detected an open indication and the name of the signal is displayed.

4.8.5 DC Impedance Test
The DC impedance test measures the voltage of the test signal with higher accuracy. The channel 1 multiplexer selects the signal for measurement. It is compared with the precision test signal which is a controlled termination.

4.8.6 AC Impedance Test (Out of Scope)
Although it is not a requirement to perform an AC impedance test, the VBT by its design can make a rough AC impedance measurement. If this is deemed important, this test can be added to the capabilities of the VBT with a simple PROM upgrade. The AC impedance check could find faults such as corrosion between pins that would not be detected by the DC impedance measurements. Further tests can be run to determine the effectiveness of this test.

The test would drive a test signal of varying frequencies on channel 1 and measure the amplitude of the signal on channel 2. The test signals on the VBT include terminations with varying capacitive loads on the signal and can be used as a comparison with the signal under test.

5.0 Specifications

5.1 GENERAL SPECIFICATIONS

Signal Protection

Power On: -40V to +40V Power Off: -40V to +40V

VME Signals Tested

D[31:0], A[31:01], AM[5:0], DS[1:0], AS*, WRITE*, LWORD*, DTACK*, BERR*, RETRY*, SERA, SERB , IACK*, IACKIN*, IACKOUT*, IRQ[7:1], SYSRESET*, SYSFAIL*, SYSCLK, ACFAIL*, BBSY*, BCLR*, BR[3:0], BGIN[3:0], BGOUT[3:0],

VME64x Additional Signals Tested

GAP*, GA[4:0], LI/I, LI/O, RESP*, MPR, MCLK, MSD, MMD, MCTL,
Rsvbus pins on P1 Row D, Rsvbus pins on P1 Row Z

Power Supplies Tested

+5V, +12V, -12V, 5VSTDBY, +3.3V, VPC, +V1, +V2, -V1, -V2

Power Supplies Monitored

+5V, +12V, -12V LED bi-color front panel indicators
Illuminates RED when out of range, GREEN when in range
+5V range: 4.875V to 5.25V
+12V range: 11.64V to 12.60V
-12V range: -11.64V to –12.60V

Miscellaneous Features

Detection and display of geographical address
Automatic detection of VME and VME64x backplanes
Tests both powered and unpowered backplanes
Hot Swap Capable

Front Panel Control and Display

Alphanumeric 24 character LED display
Power Supply monitor bi-color LEDs (x3)
Test selection toggle switch: 3 position ON-OFF-ON
Results Scroll pushbutton: momentary click
External power connector: 2 wire
Power selector slide switch (recessed)

Power Requirements

Operating—3.0V to 6.25V at 1 Amps max
Standby—3.0V to 6.25V at 0.5 Amp max
Fully isolated from supply to 1500 Vdc
Operates from bus or external power
Slide switch selection

Environmental

Operating Temperature –40 to +85 deg C
Storage Temperature –55 to +100 deg C
Humidity Up to 85% Non-Condensing

Dimensions

VME 6U Eurocard, 220 mm deep

5.2 TEST SPECIFICATIONS

Test Times

Total test time: 90 sec. max
Initialization time: 3 sec. max

Tests Performed

Test A: Power Supply, Intrusive Voltage
Test B: Power Supply, Intrusive Voltage, Short, Open, Impedance

Results

Displayed: Failures after test executed
Information: Signal names, pin / connector numbers
Control: Scroll thru results using pushbutton
Result buffer capacity: approx. 192 failures

Power Supply Test

Measured:+5V, +12V, -12V, 5VSTDBY,+3.3V, VPC, +V1, +V2, -V1, -V2
Measurement range: -40V to +40V
Accuracy: +/-10 mv
Measure Interval: Continuous and test switch
Acceptable Range:
+5V range: 4.875V to 5.25V
+12V range: 11.64V to 12.60V
-12V range: -11.64V to –12.60V

Intrusive Voltage Test

Measured: All bussed and daisy chained signals
Measurement range: -40V to +40V
Accuracy: +/-40 mv
Measure Interval: Test switch
Acceptable Range: -0.8V to 5.25V

Short Test

Measured: All bussed and daisy chained signals
Measurements: Signal, ground and power short
Measure interval: Test switch
Measurement method: Drive test pulse
Short Resistance: < 100 ohms
Ground short detection voltage: < 0.25V
Power short detection voltage: > 4.75V

Open Test

Measured: All bussed signals
Measurements: Missing pullups and pulldowns
Measure Interval: Test switch

Impedance Test

Measured: All bussed signals
Measurements: High and Low impedance
Measure Interval: Test switch
Serial impedance detection: < 50 ohms

6.0 P1 Connector

Pin Number	Row Z Signal Mnemonics	Row A Signal Mnemonics	Row B Signal Mnemonics	Row C Signal Mnemonics	Row D Signal Mnemonics
1	MPR	D00	BBSY*	D08	VPC1
2	GND	D01	BCLR*	D09	GND
3	MCLK	DO2	ACFAIL*	D10	+V1
4	GND	D03	BG0IN*	D11	+V2
5	MSD	D04	BG0OUT*	D12	RSV11
6	GND	D05	BG1IN*	D13	-V1
7	MMD	D06	BG1OUT*	D14	-V2
8	GND	D07	BG2IN*	D15	RSV12
9	MCTL	GND	BG2OUT*	GND	GAP*
10	GND	SYSCLK	BG3IN*	SYSFAIL	GA0*
11	RESP*	GND	BG3OUT*	BERR*	GA1*
12	GND	DS1	BR0*	SYSRES	3.3V
13	RESV1	DS0	BR1*	LWORD*	GA2*
14	GND	WRITE*	BR2*	AM5	3.3V
15	RESV2	GND	BR3*	A23	GA3*
16	GND	DTACK*	AM0	A22	3.3V
17	RESV3	GND	AM1	A21	GA4*
18	GND	AS*	AM2	A20	3.3V
19	RESV4	GND	AM3	A19	RSV13
20	GND	IACK*	GND	A18	3.3V
21	RESV5	IACKIN	SERA	A17	RSV14
22	GND	IACKOUT	SERB	A16	3.3V
23	RESV6	AM4	GND	A15	RSV15
24	GND	A07	IRQ7	A14	3.3V
25	RESV7	A06	IRQ6	A13	RSV16
26	GND	A05	IRQ5	A12	3.3V
27	RESV8	A04	IRQ4	A11	LI/I
28	GND	A03	IRQ3	A10	3.3V
29	RESV9	A02	IRQ2	A09	LI/O
30	GND	A01	IRQ1	A08	3.3V
31	RESV10	-12V	5VSTDBY	12V	GND
32	GND	5V	5V	5V	VPC2

* Power and ground connections highlighted

7.0 P2 Connector

Pin Number	Row Z Signal Mnemonics	Row A Signal Mnemonics	Row B Signal Mnemonics	Row C Signal Mnemonics	Row D Signal Mnemonics
1			5V		
2	GND		GND		
3			RETRY*		
4	GND		A24		
5			A25		
6	GND		A26		
7			A27		
8	GND		A28		
9			A29		
10	GND		A30		
11			A31		
12	GND		GND		
13			5V		
14	GND		D16		
15			D17		
16	GND		D18		
17			D19		
18	GND		D20		
19			D21		
20	GND		D22		
21			D23		
22	GND		GND		
23			D24		
24	GND		D25		
25			D26		
26	GND		D27		
27			D28		
28	GND		D29		
29			D30		
30	GND		D31		
31			GND		
32	GND		5V		

* Power and ground connections highlighted

Revision Notes:

Version 1.2
1. Original Released Document

Version 1.3
1. Added missing signals to section 6.0 P1 connector table.