

**WIRELESS**

# Manufacturing Test Suite

## Libertas™ 802.11g Client Card

### Evaluation Tool User Guide

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# 802.11g Client Card Evaluation Tool User Guide

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# Section 1. Getting Started

## 1.1 Overview

This document explains how to use the software command line interface for the following Libertas™ Wireless LAN (WLAN) client cards:

- Marvell® CB-32 802.11g WLAN CardBus Card
- Marvell® MB-31 802.11g WLAN Mini PCI Card

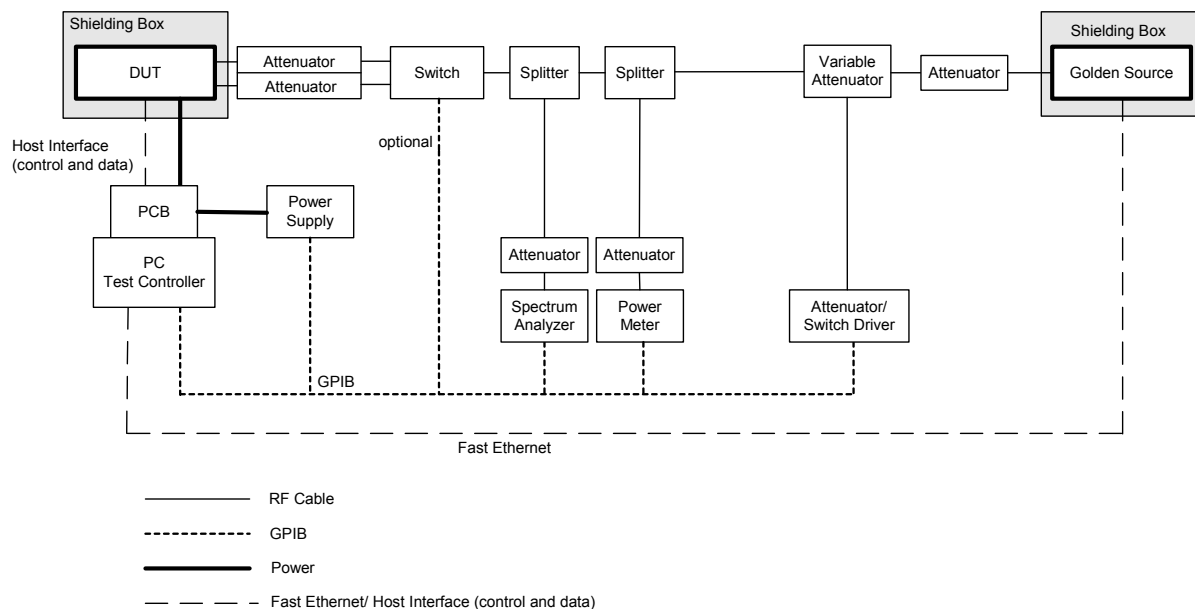
These cards include the highly integrated Libertas™ IEEE 802.11g two-chip solutions for client applications. The chipset consists of the 88W8000G Radio Frequency Transceiver and the 88W8310 WLAN Client device.

## 1.2 Equipment

The overall setup for testing the capabilities and performance of the Libertas™ family of WLAN chipset solutions is shown in Figure 1. The setup shows the equipment required to test the transmit/receive chains and throughput between a DUT and a golden source. Proper shielding is required for both the DUT and the golden source.

### 1.2.1 Test Setup

Figure 1: Test Setup



## 1.2.2 Calibration

It is critical to obtain accurate measurements of the path loss (due to cables, connectors, etc.) from the DUT to the Golden Unit and from the DUT to the power meter. For path loss measurements, sum the loss of each individual component along the path. Figure 2 shows the RF path loss for calibration. Figure 3 shows the switch settings for the programmable attenuator.

Figure 2: RF Path

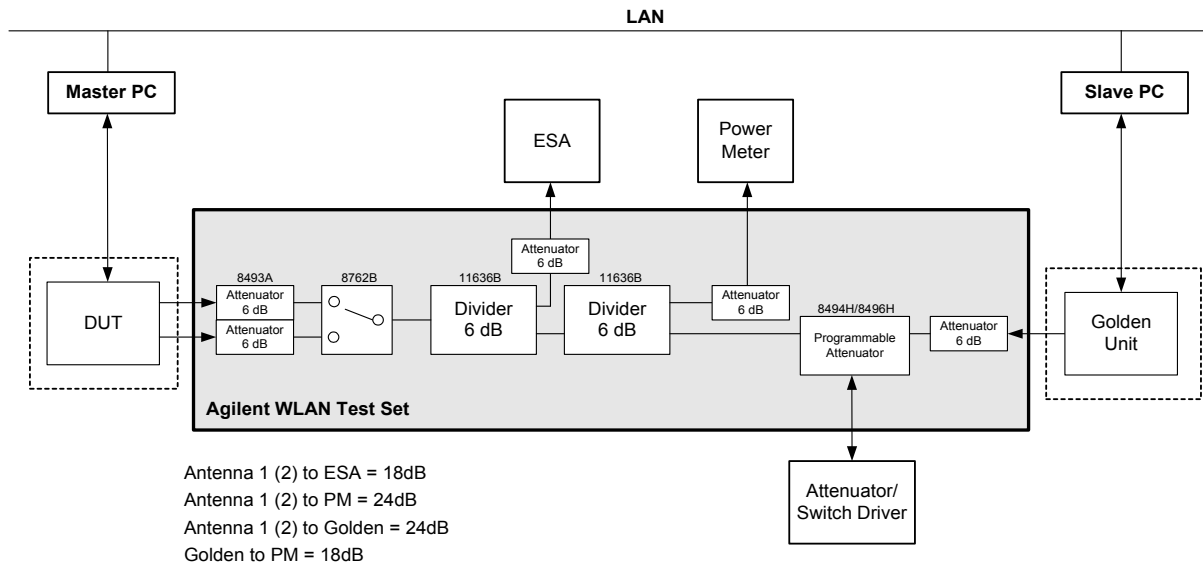
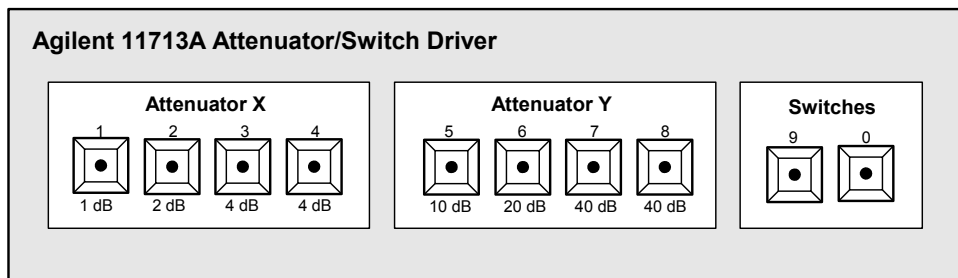


Figure 3: Switch Driver



## 1.3 System Requirements

- 300 MHz or faster CPU
- Windows® 2000 or 98SE (Second Edition)
- Marvell Libertas™ Client Card (CardBus or Mini PCI)

## Section 2. Software Requirements

### 2.1 Manufacturing Test Software Suite Contents

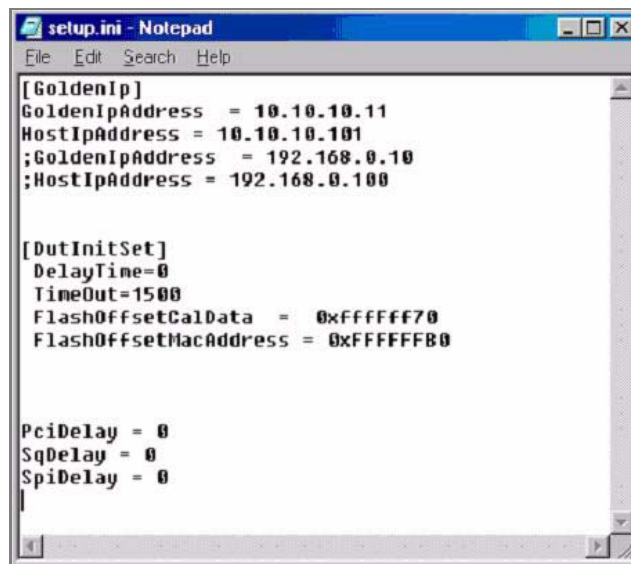
Table 1: Manufacturing Test Software

Filename	Description
SetUp.ini	Setup file. See <a href="#">Figure 4</a> .
DutApi98Dll.dll	DLL file for DUT.
DutApiPci98_G.exe	Manual test module executable for client card.
GoldenAP.exe	Manual test module executable for AP golden unit.
CalDataFile.txt	Example manufacturing calibration data file. See <a href="#">Appendix A. "Sample CalDataFile.txt"</a> .
Spi.hex	Hexadecimal file to program SPI (see command 35).

### 2.2 Software Installation

1. Copy the manufacturing test software files to a directory on the C: drive. DutApiPci98\_G.exe, DutApi98Dll.dll, and SetUp.ini must be in the same directory.
2. Open the SetUp.ini file with a text editor. When running both the DutApiPci98\_G.exe and GoldenAP.exe test files, the SetUp.ini should contain the Golden Unit IP addresses and DUT and Golden setup information:

Figure 4: Setup File



```
[GoldenIp]
GoldenIpAddress = 10.10.10.11
HostIpAddress = 10.10.10.101
;GoldenIpAddress = 192.168.0.10
;HostIpAddress = 192.168.0.100

[DutInitSet]
DelayTime=0
TimeOut=1500
FlashOffsetCalData = 0xFFFFFFFF70
FlashOffsetMacAddress = 0xFFFFFFFFB0

PciDelay = 0
SqDelay = 0
SpiDelay = 0
```

## 2.3 Windows Driver Installation

Installation of the driver will allow the user to access hardware memory space. The following files are required:

- MWLAN\_G.inf
- windrvr.vxd
- DutApiPci98\_G.exe
- wdreg.exe

### 2.3.1 Driver Installation Procedure

Windows explorer may not show \*.Vxd file on the folder. At the MS-DOS command prompt, use the directory (DIR) command to check the entire contents of the installation disk.



#### Notes

- In some of the commands below you are asked to type a text string enclosed in double quotes. Do not type the quotes, they are just there for clarity.
  - Commands that you type in are in **bold**.
  - Pressing the **Enter** key after typing in a text string is assumed.
1. Copy windrvr.vxd from the installation disk to c:\windows\system\vm32 directory.
  2. Create an application directory (for example, "**mkdir** c:\mactest").
  3. Copy DutApiPci98\_G.exe and wdreg.exe from the installation disk to the application directory.
  4. Insert the Marvell card and Windows 98SE will run the device installation wizard.  
Use the INF file (a:\MWLAN\_G.inf) on the installation disk to install the device.
  5. Open the MS-DOS command prompt window and change the directory to the application directory (for example, "**cd** c:\mactest").
  6. Type "**WDREG.EXE -VXD install**" to run the registration program. This is CASE-SENSITIVE.  
The following messages should appear:  
Creating driver entry... OK  
Starting driver entry... OK
  7. Open the MS-DOS command prompt window:
    - a) Change the directory to the application directory (for example, "**cd** c:\mactest").
    - b) Type "**DutApiPci98\_G.exe**" to run the test program.



## 2.3.2 Programming Configuration Information

The configuration information (MAC address, calibration data, CIS table, etc.) are saved in EEPROM and are accessed through the SPI interface. The image can be also programmed through the PCI interface. There are two ways to program the image (build-in SPI or with a hex file). Although the build-in image is more stable, loading the image from a hex file allows access to more recent information and allows more flexibility.

To program build-in image:

1. Type the command **37**.
2. Type **38** to verify the image against the build-in image. There should be no errors reported.
3. Type **48**.  
This command programs the sub-PID and sub-VID for the Marvell Mini PCI card (**47** for the CardBus).

To program the image from the file:

1. Type **39**.  
The current file name is displayed in brackets. The default is Spi.hex.  
When prompted for filename, either press **Enter** or type Spi.hex.  
If there is no change to the configuration, press **Enter**. If there is a change, the configuration information from the file name entered is retained for this execution (replaces the information in the default file).
2. Type **40**.  
This command will verify the image against the given file.
3. Type **48**.  
This command programs the sub-PID and sub-VID for the Marvell Mini PCI card (47 for the CardBus).

After downloading the image, or if the image already exists, the MAC address is programmed as follows:

1. Type "**46** xx.xx.xx.xx.xx.xx".  
This command writes the MAC address (xx.xx.xx.xx.xx.xx). Use command 45 to view the MAC address currently programmed.
  - a) Use hexadecimal values in the following format: xx.xx.xx.xx.xx.xx for the MAC address.
  - b) Enter the values with a period (.) in between number pairs.
2. Type **99** to exit.



### Notes

- To view the these commands, run the DutApiPci98\_G.exe file as follows: "**DutApiPci98\_G.exe -m**". The space is required between DutApiPci98\_G.exe and -m. See [3.1.3 "Additional Menu Interface" on page 13](#).
- Command **37** can be used to download the build-in Spi.hex file. However, when a new Spi.hex is available, use command **39**. When using command **37**, use command **48** to program PID/VID.



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## Section 3. Command Line Interface

### 3.1 Using the Manual Test Module

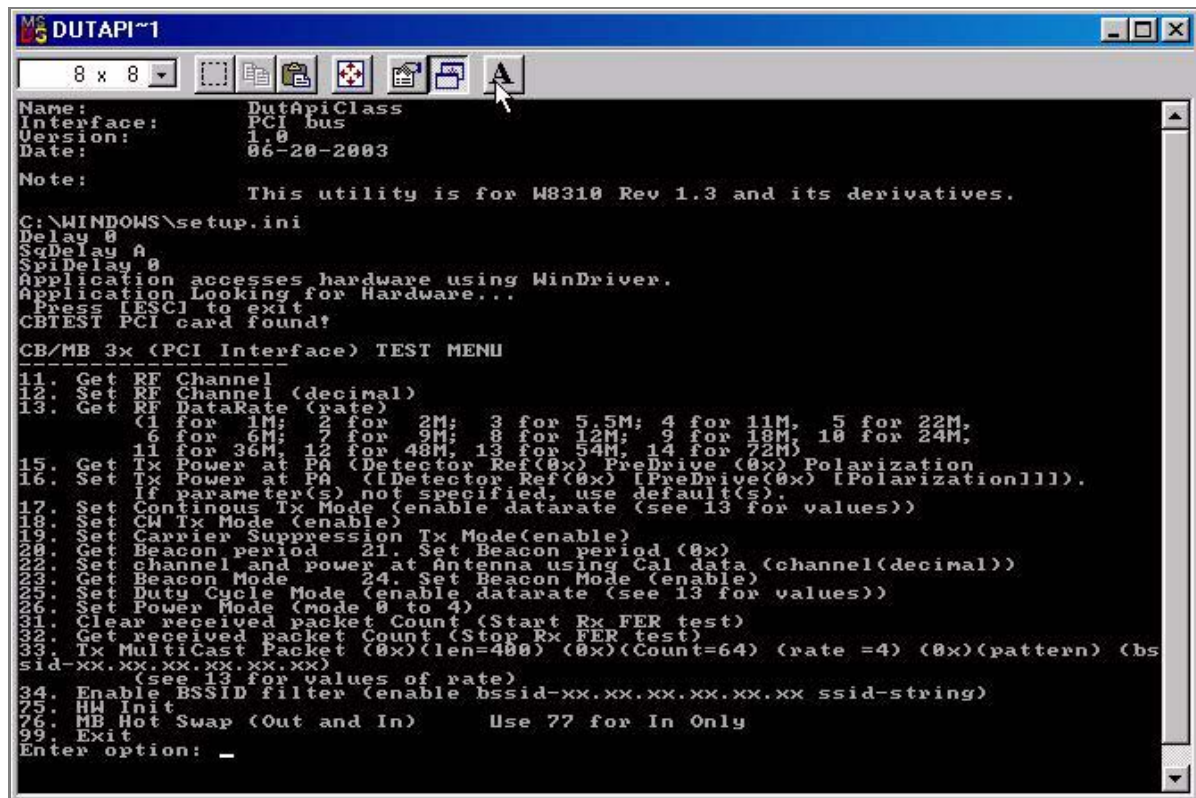
The manual test module runs through a simple menu-driven interface. Two executable files are needed for the test. The Setup.ini file must be located in the same directory as the executable files.

- DutApiPci98\_G.exe. Controls the CardBus and Mini PCI cards.
- GoldenAP.exe. Controls the Golden unit. Needed for Rx Sensitivity tests (unless a signal generator is used).
- Setup.ini

Run both the DutApiPci98\_G.exe and GoldenAP.exe files to launch the tool. Each command is numbered, and some commands accept input parameters. For example, to retrieve the current channel setting, type **11** and press **Enter**. This command returns the current channel. To set the channel to 6, type “**12 6**” and press **Enter**, where **12** is the command and 6 is the input parameter.

#### 3.1.1 DUT Interface

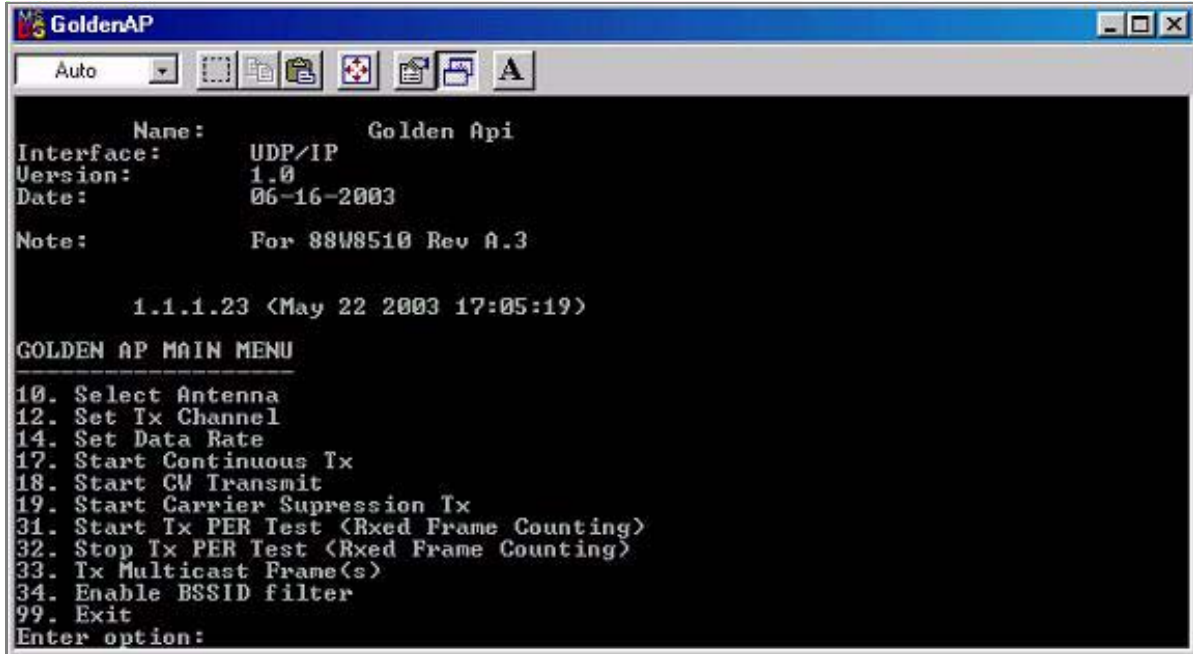
Figure 5: PCI Interface Test Menu (DutApiPci98\_G.exe)



```
MS-DOS DUTAPI~1
8 x 8
Name:          DutApiClass
Interface:     PCI bus
Version:       1.0
Date:          06-20-2003
Note:
              This utility is for W8310 Rev 1.3 and its derivatives.
C:\WINDOWS\setup.ini
Delay 0
SubDelay A
SubDelay 0
Application accesses hardware using WinDriver.
Application Looking for Hardware...
Press [ESC] to exit
CBTEST PCI card found!
-----
CB/MB 3x (PCI Interface) TEST MENU
11. Get RF Channel (decimal)
13. Set RF Channel (decimal)
14. Get RF DataRate (rate)
    (1 for 1M; 2 for 2M; 3 for 5.5M; 4 for 11M, 5 for 22M,
    6 for 6M; 7 for 9M; 8 for 12M; 9 for 18M, 10 for 24M,
    11 for 36M, 12 for 48M, 13 for 54M, 14 for 72M)
15. Get Tx Power at PA (Detector Ref(0x) PreDrive (0x) Polarization
16. Set Tx Power at PA (Detector Ref(0x) [PreDrive(0x) [Polarization]]).
    If parameter(s) not specified, use default(s).
17. Set Continuous Tx Mode (enable datarate (see 13 for values))
18. Set CW Tx Mode (enable)
19. Set Carrier Suppression Tx Mode(enable)
20. Set Beacon period 21. Set Beacon period (0x)
21. Set channel and power at Antenna using Cal data (channel(decimal))
22. Get Beacon Mode 24. Set Beacon Mode (enable)
23. Set Duty Cycle Mode (enable datarate (see 13 for values))
25. Set Power Mode (mode 0 to 4)
26. Clear received packet Count (Start Rx FER test)
27. Get received packet Count (Stop Rx FER test)
28. Tx Multicast Packet (0x)(len=400) (0x)(Count=64) (rate =4) (0x)(pattern) (bs
    sid-xx.xx.xx.xx.xx.xx)
    (see 13 for values of rate)
34. Enable BSSID filter (enable bssid-xx.xx.xx.xx.xx.xx ssid-string)
75. HW Init
76. MB Hot Swap (Out and In) Use 77 for In Only
99. Exit
Enter option: _
```

## 3.1.2 Golden Unit Interface

Figure 6: Golden AP Main Menu (GoldenAP.exe)



```
GoldenAP
Auto
Name: Golden Api
Interface: UDP/IP
Version: 1.0
Date: 06-16-2003
Note: For 88W8510 Rev A.3

1.1.1.23 <May 22 2003 17:05:19>
GOLDEN AP MAIN MENU
-----
10. Select Antenna
12. Set Tx Channel
14. Set Data Rate
17. Start Continuous Tx
18. Start CW Transmit
19. Start Carrier Suppression Tx
31. Start Tx PER Test <Rxd Frame Counting>
32. Stop Tx PER Test <Rxd Frame Counting>
33. Tx Multicast Frame(s)
34. Enable BSSID filter
99. Exit
Enter option:
```

### 3.1.3 Additional Menu Interface

There is also an additional menu of commands available. To open the menu, add a "-m" argument in the target line after typing the file name. [Figure 7](#) shows how to create a shortcut for the additional menu interface.

**Figure 7: Additional Menu Shortcut**

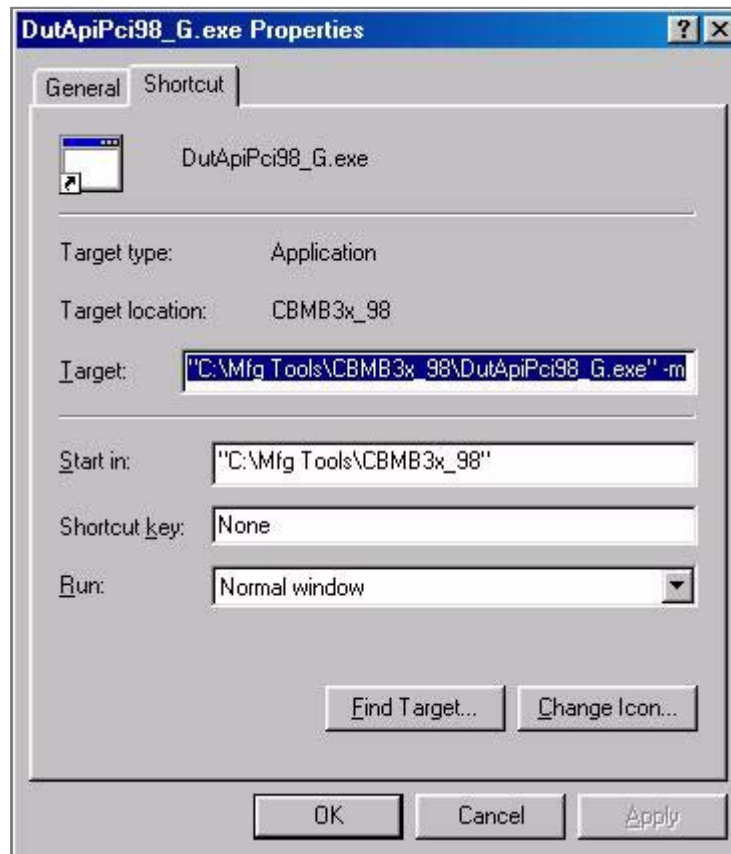
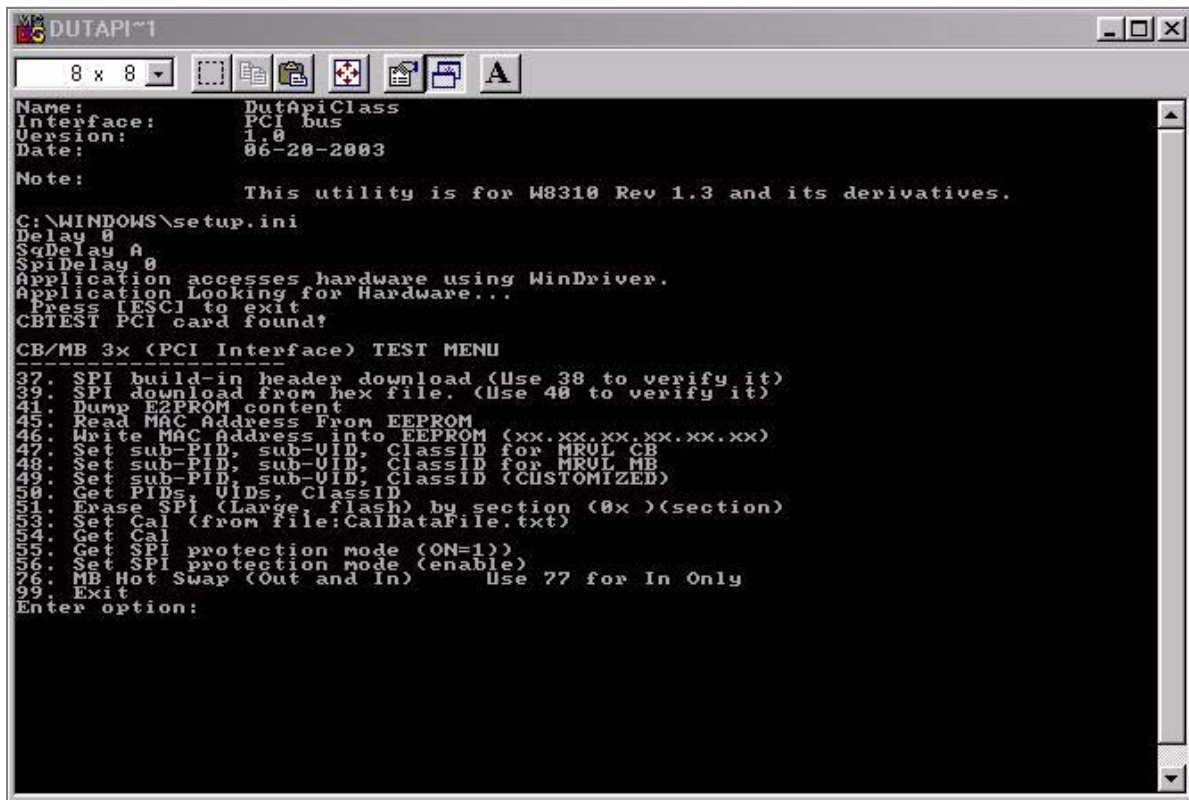


Figure 8: PCI Interface Test Menu (DutApiPci98\_G.exe -m)



```
DUTAPI™1
8 x 8
Name:          DutApiClass
Interface:     PCI bus
Version:       1.0
Date:          06-20-2003

Note:
      This utility is for W8310 Rev 1.3 and its derivatives.

C:\WINDOWS\setup.ini
Delay 0
SqdDelay A
SpidDelay 0
Application accesses hardware using WinDriver.
Application Looking for Hardware...
Press [ESC] to exit
CBTEST PCI card found!

CB/MB 3x (PCI Interface) TEST MENU
-----
37. SPI build-in header download (Use 38 to verify it)
39. SPI download from hex file. (Use 40 to verify it)
41. Dump EEPROM content
45. Read MAC Address From EEPROM
46. Write MAC Address into EEPROM (xx.xx.xx.xx.xx.xx)
47. Set sub-PID, sub-UID, ClassID for MRUL CB
48. Set sub-PID, sub-UID, ClassID for MRUL MB
49. Set sub-PID, sub-UID, ClassID (CUSTOMIZED)
50. Get PIDs, UIDs, ClassID
51. Erase SPI (Large, flash) by section (0x)(section)
53. Set Cal (from file:CalDataFile.txt)
54. Get Cal
55. Set SPI protection mode (ON=1)
56. Set SPI protection mode (enable)
57. MB Hot Swap (Out and In) Use 77 for In Only
99. Exit
Enter option:
```

### 3.1.4 Before Getting Started

Initialize the device after launching the manual test module. Enter command 75 before running any RF tests.

Figure 9: Initialize Device (Command 75)

```
MS-DOS [C:\WINDOWS] DUTAPI~1
8 x 8
Interface: PCI bus
Version: 1.0
Date: 06-20-2003
Note: This utility is for W8310 Rev 1.3 and its derivatives.
C:\WINDOWS\setup.ini
Delay 0
SqrDelay A
SpiDelay 0
Application accesses hardware using WinDriver.
Application Looking for Hardware...
Press [ESC] to exit
CBTEST PCI card found!
-----
CB/MB 3x (PCI Interface) TEST MENU
11. Get RF Channel
12. Set RF Channel (decimal)
13. Get RF DataRate (rate)
    (1 for 1M; 2 for 2M; 3 for 5.5M; 4 for 11M, 5 for 22M,
    6 for 36M; 7 for 48M; 8 for 54M; 9 for 72M, 10 for 24M,
    11 for 36M, 12 for 48M, 13 for 54M, 14 for 72M)
15. Get Tx Power at PA (Detector Ref(0x) PreDrive(0x) Polarization
16. Set Tx Power at PA (Detector Ref(0x) PreDrive(0x) Polarization
    If parameter(s) not specified, use default(s).
17. Set Continuous Tx Mode (enable datarate (see 13 for values))
18. Set CW Tx Mode (enable)
19. Set Carrier Suppression Tx Mode(enable)
20. Get Beacon period 21. Set Beacon period (0x)
22. Set channel and power at Antenna using Cal data (channel(decimal))
23. Get Beacon Mode 24. Set Beacon Mode (enable)
25. Set Duty Cycle Mode (enable datarate (see 13 for values))
26. Set Power Mode (mode 0 to 4)
27. Clear received packet Count (Start Rx FER test)
28. Get received packet Count (Stop Rx FER test)
29. Tx MultiCast Packet (0x)(len=400) (0x)(Count=64) (rate =4) (0x)(pattern) (bs
sid-xx.xx.xx.xx.xx)
    (see 13 for values of rate)
34. Enable BSSID filter (enable bssid-xx.xx.xx.xx.xx ssid-string)
75. HW Init
76. MB Hot Swap (Out and In) Use 77 for In Only
99. Exit
Enter option: 75
75
DutIf_InitHW: 0
Press [Enter] key to continue ...
```



## 3.2 Receiver Sensitivity Test

### 3.2.1 Overview

The receiver sensitivity test is based on frame error rate (FER). The test will send a known number of frames, count the number of frames received on the DUT, and calculate the frame error rate. According to the IEEE specification, sensitivity is the lowest input power level needed to achieve a FER less than 8% for 802.11b data rates, and 10% for 802.11g data rates.

For the manufacturing test, the Golden Unit is used to transmit packets.

### 3.2.2 Test Procedure

1. Launch the GoldenAP.exe and DutApiPci98\_G.exe files.
2. Type **75** to initialize the DUT (in the DutApiPci98\_G.exe menu).
3. Type "**12 x**" (where "x" is the channel number) to set the desired channel on the DUT.
4. Type **31** to clear the received packet counter.
5. OPTIONAL: Type "**34 1 11.22.33.44.55.66**" to filter on BSSID.  
In this example, only frames with BSSID = 11.22.33.44.55.66 will be counted.
6. Set the channel for the Golden Unit (in the GoldenAP.exe menu).  
Type **33**. The user is prompted to enter the length, count, data rate, pattern, and BSSID as parameters.
7. Type **32** to read the received packet counter. The DUT will report the number of frames received correctly (for example, no CRC error), the number of multicast frames received correctly, and the number of frames received with CRC errors. Calculate the FER based on the number of frames sent by the Golden Unit.
8. If necessary, adjust the settings on the programmable attenuators to achieve the desired FER.



#### Note

To verify the DUT is properly shielded, clear the received packet counter, wait a few seconds, and read the packet counter. The packet counter should read 0.



### 3.3 Transmitter Tests

As an example, this section describes how to use the manual test module to set the DUT to Tx mode.

1. Connect antenna port 1 to the spectrum analyzer and power meter.
2. Start the manual test module.
3. Type **75** to initialize the DUT.
4. Type "**12 x**" (where "x" is the channel number) to set the desired channel on the DUT.
5. Type "**17 1 13**" to enable continuous transmission at the 54 Mbps data rate. The device will output a continuous modulated signal.
6. Type "**17 0**" to disable continuous transmission.
7. Type "**18 1**" to enable carrier wave continuous transmission.
8. Type "**18 0**" to disable carrier wave continuous transmission.
9. Type "**33 400 64 13 AAAAAAAAAA xx.xx.xx.xx.xx.xx**" (where AA's are the frame pattern and xx's are the BSSID) to transmit 100 1 KB data packets at a 54 Mbps data rate.



#### Notes

- The default register values provided by Marvell are the settings used to achieve the highest output power while still meeting the IEEE specification requirements.
- If the measured EVM is higher than specified in the IEEE specification, please contact your Marvell Field Applications Engineer.



## 3.4 Command Descriptions

This section describes each command in detail.

### 3.4.1 RF Commands

#### 3.4.1.1 Get RF Channel

<b>Command Number</b>	11
<b>Name</b>	Get RF Channel.
<b>Parameters</b>	none
<b>Description</b>	Returns current RF channel number.
<b>Example</b>	n/a

#### 3.4.1.2 Set RF Channel

<b>Command Number</b>	12
<b>Name</b>	Set RF Channel
<b>Parameters</b>	Channel (1 through 14)
<b>Description</b>	Sets the RF channel.
<b>Example</b>	"12 11" sets the channel to 11.

#### 3.4.1.3 Get RF Data Rate

<b>Command Number</b>	13
<b>Name</b>	Get RF data rate
<b>Parameters</b>	none
<b>Description</b>	Returns the current data rate: 1 = 1 Mbps 2 = 2 Mbps 3 = 5.5 Mbps 4 = 11 Mbps 5 = 22 Mbps (Marvell proprietary) 6 = 6 Mbps 7 = 9 Mbps 8 = 12 Mbps 9 = 18 Mbps 10 = 24 Mbps 11 = 36 Mbps 12 = 48 Mbps 13 = 54 Mbps 14 = 72 Mbps (Marvell proprietary)
<b>Example</b>	n/a
<b>Negative Number</b>	Unable to be detected when MAC/BBP controls data rate through frame information. The data rate is unable to be detected.

#### 3.4.1.4 Get Tx Power at PA

<b>Command Number</b>	15
<b>Name</b>	Get Tx Power at PA
<b>Parameters</b>	None
<b>Description</b>	Returns the RF power settings. (RF power detector reference; predrive and polarization values).
<b>Example</b>	n/a

#### 3.4.1.5 Set Tx Power at PA

<b>Command Number</b>	16
<b>Name</b>	Set Tx Power at PA
<b>Parameters</b>	16 [RefDac [predriver [externalPAPolarization]] Detector Reference Predrive Polarization
<b>Description</b>	Sets the RF power.
<b>Example</b>	"16 [DetRef] [Predrive] [Polarization]"

#### 3.4.1.6 Set Continuous Modulated Waveform Mode

<b>Command Number</b>	17 [enable_dataRate]
<b>Name</b>	Set Continuous Modulated Waveform Mode
<b>Parameters</b>	Enable (1 = enable, 0 = disable) data rate
<b>Description</b>	Sets the device for continuous transmission of a modulated waveform.
<b>Example</b>	"17 1 13" sets the device for continuous transmission at the 54 Mbps data rate. "17 0" disables continuous transmission.

#### 3.4.1.7 Set Continuous Waveform Transmission Mode

<b>Command Number</b>	18
<b>Name</b>	Set Continuous Waveform Transmission Mode
<b>Parameters</b>	Enable (1 = enable, 0 = disable)
<b>Description</b>	Sets the device to continuously transmit a carrier waveform.
<b>Example</b>	"18 1" sets the device to continuously transmit a carrier waveform. "18 0" disables this mode.

#### 3.4.1.8 Set Carrier Suppression Mode

<b>Command Number</b>	19
<b>Name</b>	Set Carrier Suppression Transmission Mode
<b>Parameters</b>	Enable (1 = enable, 0 = disable)
<b>Description</b>	Sets the device for Carrier Suppression Transmission Mode.
<b>Example</b>	"19 1" sets the device for Carrier Suppression Transmission Mode.

#### 3.4.1.9 Set Channel and Power at Antenna with Calibration Data

<b>Command Number</b>	22
<b>Name</b>	Set channel and RF power at antenna with calibration data for the channel



## Libertas™ 802.11g Client Card Evaluation Tool User Guide

---

### Parameters

Channel 1 through 14:

1 = Channel 1

2 = Channel 2

3 = Channel 3

4 = Channel 4

5 = Channel 5

6 = Channel 6

7 = Channel 7

8 = Channel 8

9 = Channel 9

10 = Channel 10

11 = Channel 11

12 = Channel 12

13 = Channel 13

14 = Channel 14

### Description

Sets the power using calibration data.

### Example

"22 6" sets the channel to 6 and RF power using calibration data for channel 6.

### 3.4.1.10 Set Duty Cycle Transmission Mode

<b>Command Number</b>	25
<b>Name</b>	Set duty cycle transmission mode
<b>Parameters</b>	Enable (1 = enable, 0 = disable) Data rate: 1 = 1 Mbps 2 = 2 Mbps 3 = 5.5 Mbps 4 = 11 Mbps 5 = 22 Mbps (Marvell proprietary) 6 = 6 Mbps 7 = 9 Mbps 8 = 12 Mbps 9 = 18 Mbps 10 = 24 Mbps 11 = 36 Mbps 12 = 48 Mbps 13 = 54 Mbps 14 = 72 Mbps (Marvell proprietary)
<b>Description</b>	Sets the device to duty cycle transmit. The duty cycle is about 50% for lower data rates and decreases as the data rate increases.
<b>Example</b>	"25 1 13" sets device to duty cycle transmit at 54 Mbps.

### 3.4.1.11 Set Power Mode (Not Implemented)

<b>Command Number</b>	26
<b>Name</b>	Set power mode
<b>Parameters</b>	Power mode: 0 = active 1 = standby long 2 = power down 3 = deep sleep 4 = standby short
<b>Description</b>	Sets the power mode of the device. This command is not implemented yet.
<b>Example</b>	"26 0" sets device to active power mode.

## 3.4.2 FER Commands

### 3.4.2.1 Clear Received Packet Counter

<b>Command Number</b>	31
<b>Name</b>	Clear Received packet counter
<b>Parameters</b>	none
<b>Description</b>	Clears the received packet counter.
<b>Example</b>	n/a

### 3.4.2.2 Get Received Packet Counter

<b>Command Number</b>	32
<b>Name</b>	Get received packet counter
<b>Parameters</b>	none
<b>Description</b>	Returns the following values: GetRxPckt: Number of correctly received packets (no CRC error), including unicast and multicast. GetRxMultiCPkt: Number of correctly received multicast packets (a subset of the first number). GetRxErrPckt: Number of received packets with CRC errors. Frame error rate based on detected packets [GetRxErrPckt/(GetRxPckt + GetRxErrPckt)].
<b>Example</b>	n/a



#### Note

Because of the timing difference in Reading the counters, if you are in an environment that has continuous traffic, MultiCPckt count could be larger than RxPckt count.

### 3.4.2.3 Transmit Multicast Frames

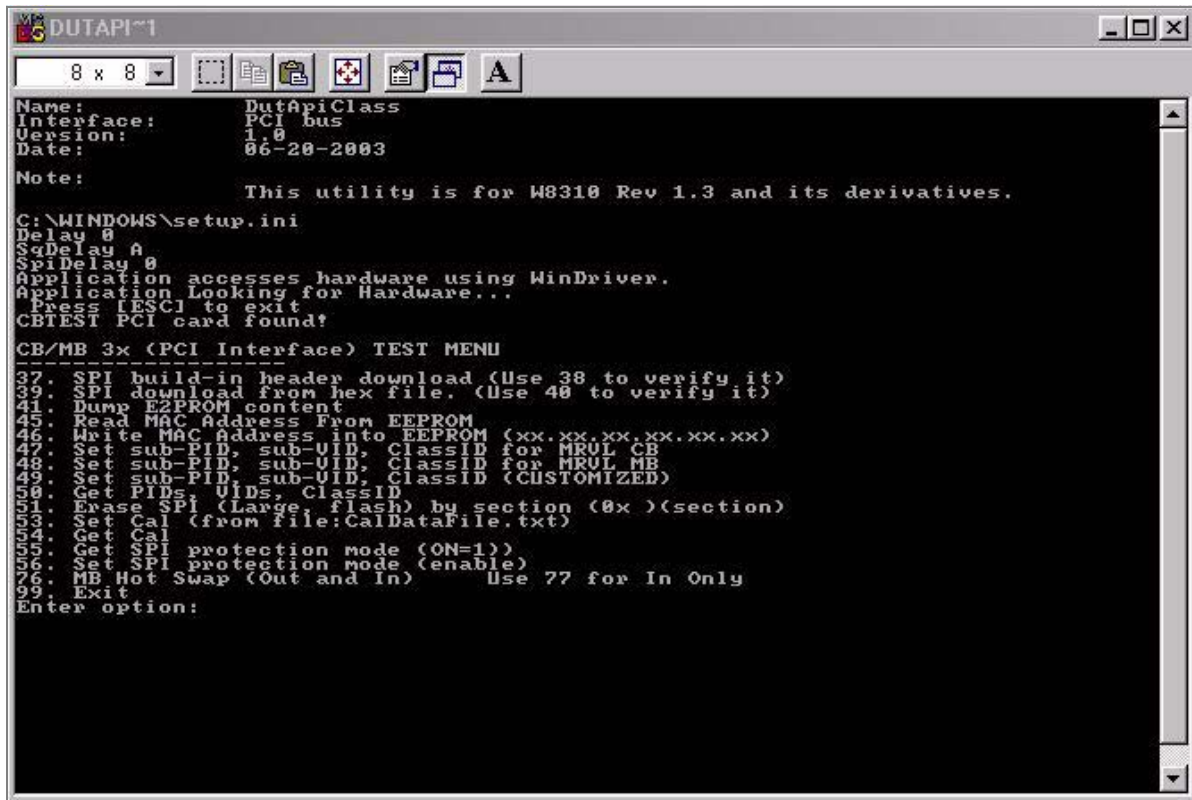
<b>Command Number</b>	33
<b>Name</b>	Transmit Multicast Frames
<b>Parameters</b>	Frame Length, in bytes (hex) Frame Count (hex) Data rate (hex): 1 = 1 Mbps 2 = 2 Mbps 3 = 5.5 Mbps 4 = 11 Mbps 5 = 22 (Marvell proprietary) 6 = 6 Mbps 7 = 9 Mbps 8 = 12 Mbps 9 = 18 Mbps A =24 Mbps B = 36 Mbps C = 48 Mbps D = 54 Mbps E = 72 Mbps (Marvell proprietary) BSSID (xx.xx.xx.xx.xx.xx) - BSSID field
<b>Description</b>	Transmits specified number of frames of specified length, at specified data rate, with BSSID set to specified value.
<b>Example</b>	" <b>33</b> 400 64 13 AAAAAAAAA 00.11.22.33.44.55" sends 100 1 KB packets at the 54 Mbps data rate, with BSSID set to 00.11.22.33.44.55 (0x400 = 1024 decimal, 0x64 = 100 decimal).

### 3.4.2.4 Enable BSSID Filter

<b>Command Number</b>	34
<b>Name</b>	Enable BSSID filter
<b>Parameters</b>	Enable (1 = enable, 0 = disable) BSSID (xx.xx.xx.xx.xx.xx)
<b>Description</b>	Sets the received packets counter to include only frames that have the specified BSSID field.
<b>Example</b>	" <b>34</b> 1 00.11.22.33.44.55" sets the filter to be BSSID = 00.11.22.33.44.55. " <b>34</b> 0" disables the filter.

### 3.4.3 Configuration Information Access Commands

Figure 10: PCI Command Line Interface



#### 3.4.3.1 SPI Build-In Header Download

<b>Command Number</b>	37
<b>Name</b>	SPI Build-In Header Download
<b>Parameters</b>	None
<b>Description</b>	Programs SPI header into EEPROM. Use command <b>39</b> with a hex file.
<b>Example</b>	<b>37</b>

#### 3.4.3.2 SPI Header Verify

<b>Command Number</b>	38
<b>Name</b>	SPI Header Verify
<b>Parameters</b>	None
<b>Description</b>	Compares SPI built-in header with SPI header in EEPROM. Returns the error count and value of mismatched double words.
<b>Example</b>	<b>38</b>



### 3.4.3.3 SPI Download

<b>Command Number</b>	39
<b>Name</b>	SPI Download from Hexadecimal File
<b>Parameters</b>	None
<b>Description</b>	Programs the SPI header using a hex file. The command will prompt the user for the filename (Spi.hex is default).
<b>Example</b>	<b>39</b>

### 3.4.3.4 SPI Verify

<b>Command Number</b>	40
<b>Name</b>	SPI Verify from Hexadecimal File
<b>Parameters</b>	None
<b>Description</b>	Compares SPI built-in header with hex file. Returns the error count and value of mismatched double words.
<b>Example</b>	<b>40</b>

### 3.4.3.5 Display SPI EEPROM Content

<b>Command Number</b>	41
<b>Name</b>	Display SPI EEPROM Content
<b>Parameters</b>	(0x)(0x)(startAddress)(Length)
<b>Description</b>	Displays the SPI EEPROM.
<b>Example</b>	"41 0 20" will display 32 DWORDS starting from offset 0.

## 3.4.4 SPI/Flash Access Commands

### 3.4.4.1 Read MAC Address

<b>Command Number</b>	45
<b>Name</b>	Read MAC Address
<b>Parameters</b>	None
<b>Description</b>	Returns the MAC address programmed in the EEPROM.
<b>Example</b>	<b>45</b>



### 3.4.4.2 Write MAC Address

<b>Command Number</b>	46
<b>Name</b>	Write MAC Address into EEPROM/Flash
<b>Parameters</b>	xx.xx.xx.xx.xx.xx
<b>Description</b>	Writes the MAC address.
<b>Example</b>	"46 10.22.33.44.55.66"

### 3.4.4.3 Set sub-PID sub-VID Class ID for Marvell CardBus Card

<b>Command Number</b>	47
<b>Name</b>	Set sub-PID sub-VID Class ID for Marvell CardBus Card
<b>Parameters</b>	None
<b>Description</b>	Writes the Product ID and Vendor ID for CardBus.
<b>Example</b>	47

### 3.4.4.4 Set sub-PID sub-VID Class ID for Marvell Mini PCI Card

<b>Command Number</b>	48
<b>Name</b>	Set sub-PID sub-VID Class ID for Marvell Mini PCI Card
<b>Parameters</b>	None
<b>Description</b>	Writes the Product ID and Vendor ID for Mini PCI.
<b>Example</b>	48

### 3.4.4.5 Set sub-PID sub-VID Class ID (Customized)

<b>Command Number</b>	49
<b>Name</b>	Set sub-PID sub-VID Class ID (Customized)
<b>Parameters</b>	Will read back current IDs then prompt for new IDs.
<b>Description</b>	Programs a customized ID.
<b>Example</b>	49

### 3.4.4.6 Get PID VID Class ID

<b>Command Number</b>	50
<b>Name</b>	Get PID VID Class ID
<b>Parameters</b>	None
<b>Description</b>	Returns the PID and VID.
<b>Example</b>	50

#### 3.4.4.7 Erase Flash

<b>Command Number</b>	51
<b>Name</b>	Erase Flash
<b>Parameters</b>	(0x)(section)
<b>Description</b>	Erases Flash memory. This command is only supported for large EEPROM sizes (1 Mbit) and will not erase small EEPROM.
<b>Example</b>	n/a

#### 3.4.4.8 Write Calibration Table

<b>Command Number</b>	53
<b>Name</b>	Write Calibration Table
<b>Parameters</b>	none
<b>Description</b>	Writes calibration table data from the file CalDataFile.txt.
<b>Example</b>	<b>53</b> <<Given sample file here>>

#### 3.4.4.9 Read Calibration Table

<b>Command Number</b>	54
<b>Name</b>	Read Calibration Table
<b>Parameters</b>	None
<b>Description</b>	Returns the calibration table data.
<b>Example</b>	54

#### 3.4.4.10 Get SPI Protection

<b>Command Number</b>	55
<b>Name</b>	Get SPI Protection
<b>Parameters</b>	None
<b>Description</b>	Retrieves setting of SPI protection status bit.
<b>Example</b>	<b>55</b>

#### 3.4.4.11 Set SPI Protection

<b>Command Number</b>	56
<b>Name</b>	Set SPI Protection
<b>Parameters</b>	1 = enables protection 0 = disables protection
<b>Description</b>	Sets SPI protection.
<b>Example</b>	" <b>56 1</b> " enables protection. " <b>56 0</b> " disables protection.

**Note:** Each write action from this program will set SPI protection mode to enable to prevent accidental crashing of the image.

### 3.4.5 Device Specific Commands

#### 3.4.5.1 Client Hardware Initialization

<b>Command Number</b>	75
<b>Name</b>	HW Init



<b>Parameters</b>	none
<b>Description</b>	Hardware initialization. This command must be used before starting the RF tests.
<b>Example</b>	n/a

### 3.4.5.2 Mini PCI Hot Swap (Out and In)

<b>Command Number</b>	76
<b>Name</b>	Mini PCI Hot Swap (Out and In)
<b>Parameters</b>	none
<b>Description</b>	Prompts you to put in a new card. After the new card is replaced, press <b>Enter</b> twice. This command must be followed by command <b>75</b> (HW Init) to use the new card.
<b>Example</b>	n/a

### 3.4.5.3 Mini PCI Hot Swap (In Only)

<b>Command Number</b>	77
<b>Name</b>	Mini PCI Hot Swap (In Only)
<b>Parameters</b>	none
<b>Description</b>	Prompts you to put in a new card. After the new card is replaced, press <b>Enter</b> twice. This command must be followed by command <b>75</b> (HW Init) to use the new card.
<b>Example</b>	n/a

## 3.4.6 Exit Test Command

### 3.4.6.1 Exit Test

<b>Command Number</b>	99
<b>Name</b>	Exit
<b>Parameters</b>	none
<b>Description</b>	Exits the program.
<b>Example</b>	n/a

## Appendix A. Sample CalDataFile.txt

---

[Configuration]

Board = MB31-001

StructRev = 1

Pa\_External = 3

AntHw =0x0a

[LED]

Led0 = 0xFF

Led1 = 0xFF

Led2 = 0xFF

Led3 = 0xFF

[CC]

CC\_primary = 0x10

CC\_secondary = 0xFF

[CCA1]

CCA\_0 = 0xff

CCA\_1 = 0xff

CCA\_2 = 0xff

CCA\_3 = 0xff

[CCA2]

CCA\_0 = 0xff

CCA\_1 = 0xff

CCA\_2 = 0xff

CCA\_3 = 0xff

[Cus]

Cus\_0 = 0xff

Cus\_1 = 0xff



[CalData]

CalTableOption = 1

ant2NotCaled = 1

ExtPaPolar\_neg = 0

ExterPA\_PartId = 0x3

ExterPA\_PreDriv = 0x4

Xosc = 1635

;Channel1\_Ant2Adjust = 0

;Channel1\_Loss = 4

;Channel1\_Tune = 4

Channel1\_PDref = 0x60

Channel2\_PDref = 0x5e

Channel3\_PDref = 0x5c

Channel4\_PDref = 0x58

Channel5\_PDref = 0x58

Channel6\_PDref = 0x56

Channel7\_PDref = 0x54

Channel8\_PDref = 0x53

Channel9\_PDref = 0x53

Channel10\_PDref = 0x54

Channel11\_PDref = 0x56

Channel12\_PDref = 0x56

Channel13\_PDref = 0x56

Channel14\_PDref = 0x56

Channel1\_Pa1 = 0xFF

Channel1\_Pa2 = 0xFF

Channel2\_Pa1 = 0xFF

Channel2\_Pa2 = 0xFF

Channel3\_Pa1 = 0xFF

Channel3\_Pa2 = 0xFF

Channel4\_Pa1 = 0xFF

Channel4\_Pa2 = 0xFF

Channel5\_Pa1 = 0xFF

Channel5\_Pa2 = 0xFF

Channel6\_Pa1 = 0xFF

Channel6\_Pa2 = 0xFF

Channel7\_Pa1 = 0xFF

Channel7\_Pa2 = 0xFF

Channel8\_Pa1 = 0xFF

Channel8\_Pa2 = 0xFF

Channel9\_Pa1 = 0xFF

Channel9\_Pa2 = 0xFF

Channel10\_Pa1 = 0xFF

Channel10\_Pa2 = 0xFF

Channel11\_Pa1 = 0xFF

Channel11\_Pa2 = 0xFF

Channel12\_Pa1 = 0xFF

Channel12\_Pa2 = 0xFF

Channel13\_Pa1 = 0xFF

Channel13\_Pa2 = 0xFF

Channel14\_Pa1 = 0xFF

Channel14\_Pa2 = 0xFF



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## Section 5. Revision History

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**Table 2: Revision History**

<b>Document Revision</b>	<b>Document Change</b>
Rev. -	First release.



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## **Federal Communication Commission Interference Statement**

---

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

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

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

### **IMPORTANT NOTE:**

#### **FCC Radiation Exposure Statement:**

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

#### **This device is intended only for OEM integrators under the following conditions:**

- 1) The antenna must be installed such that 20 cm is maintained between the antenna and users, and
- 2) The transmitter module may not be co-located with any other transmitter or antenna. As long as 2 conditions above are met, further transmitter test will not be required. However, the OEM integrator is still responsible for testing their end-product for any additional compliance requirements required with this module installed (for example, digital device emissions, PC peripheral requirements, etc.).

**IMPORTANT NOTE:** In the event that these conditions can not be met (for example certain laptop configurations or co-location with another transmitter), then the FCC authorization is no longer considered valid and the FCC ID can not be used on the final product. In these circumstances, the OEM integrator will be responsible for re-evaluating the end product (including the transmitter) and obtaining a separate FCC authorization.

#### **End Product Labeling**

This transmitter module is authorized only for use in device where the antenna may be installed such that 20 cm may be maintained between the antenna and users. The final end product must be labeled in a visible area with the following: “Contains TX FCC ID: M4Y-0XG880M”.

#### **Manual Information That Must be Included**

The users manual for OEM integrators must include the following information in a prominent location “ IMPORTANT NOTE: To comply with FCC RF exposure compliance requirements, the antenna used for this transmitter must be installed to provide a separation distance of at least 20cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter.