

**MLAN-1000DBP  
2-Port PCI Ethernet  
Adapter with  
Wake-on-LAN  
User Manual**

**Version 1.1**

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# 1 Instruction

MLAN-1000DBP is a high performance 2-port network interface card with Wake-On-LAN (WOL). It integrates INTEL 82540EM Gigabit Ethernet controllers. The Intel® 82540EM Ethernet controller is a single, compact component with integrated Gigabit Ethernet MAC and PHY layer functions.

The Intel 82540EM integrates Intel's fourth generation Gigabit MAC design with fully integrated, physical-layer circuitry to provide a standard IEEE 802.3 Ethernet interface for 1000Base-T, 100Base-TX, and 10Base-T applications (802.3, 802.3u, 802.3ab). The controller is capable of transmitting and receiving data at 1000 Mb/s, 100 Mb/s, or 10 Mb/s data rates.

MLAN-1000DBP provides a 'bypass' function to make the Ethernet cables into two LAN ports as a single cable. In this case, the card just work as a 'switch card' to route the signal from one port to another port. Refer to chapter 4 for more information.

## 1.1 Specifications

Bus interface	Standard PCI Universal bus PCI Rev.2.2
Bus speed	32/64-bit, 33/66-MHz
Chipset	INTEL 82540EM Fast Ethernet controller: Standard IEEE 802.3 Ethernet interface, 1000Base-T, 100Base-TX, and 10Base-T, 802.3, 802.3u, 802.3ab. 802.1Q VLAN
Power consumption	5V @ 3.5A (max)
Operating temperature	0 °C ~ 60 °C

## 1.2 Package Contents

MLAN-1000DBP package includes the following items:

- MLAN-1000DBP Board x 1
- Driver CD x 1
- User Manual x 1

## **2 Installation**

This chapter describes how to install the MLAN-1000DBP. The layout and dimension are also presented.

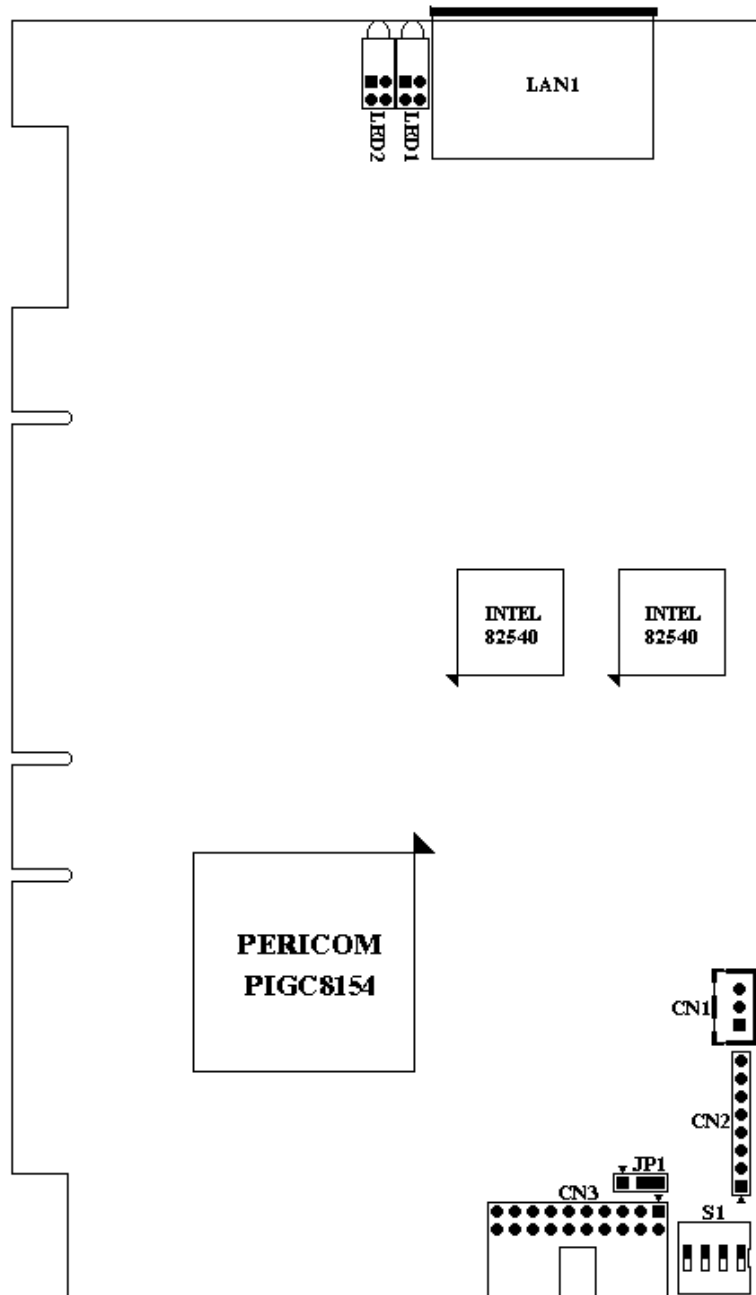
### **2.1 Installing the Adapter**

Shut down the operating system and then turn off the power for CPU boards or motherboards when you are installing the MLAN-1000DBP card.

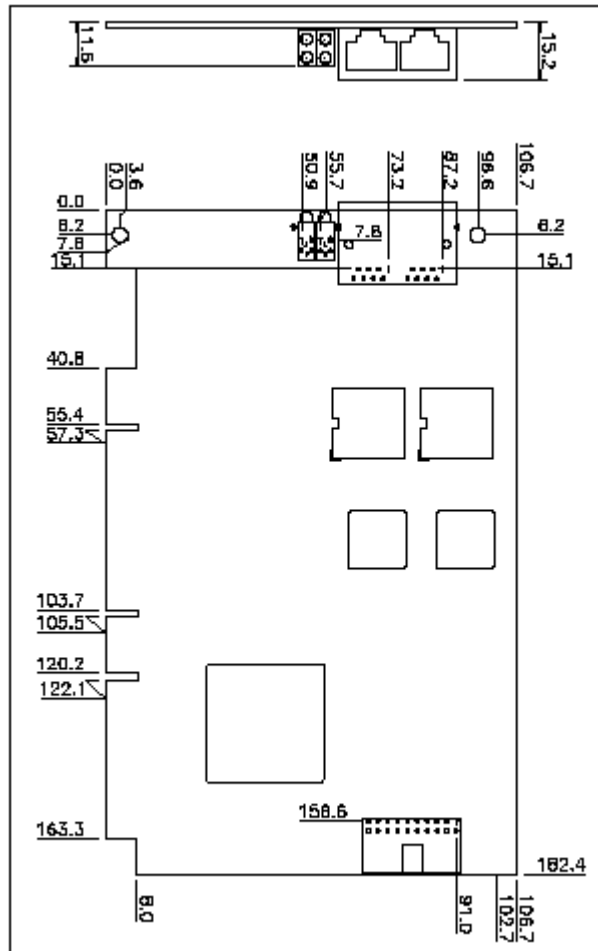
Insert the MLAN-1000DBP into a spare PCI slot.

Some components on MLAN-1000DBP are very sensitive to static electric charges and can be damaged by a sudden rush of power. When installing MLAN-1000BP, ground yourself and use a wrist strap or touch any conducting materials connected to the floor frequently to remove any static charge before touching it. It is also recommended that you remove any conductive materials you are wearing, e.g. watches or jewels.

## 2.2 Layout of MLAN-1000DBP



## 2.3 Dimension of MLAN-1000DBP



(Unit: mm)

### 3 Connection

This chapter describes how to connect peripherals, switches and indicators to the MLAN-1000DBP.

#### 1.1 LAN RJ-45 Connector

MLAN-1000DBP is equipped with four 100/1000Mbps Ethernet controllers, which are connected to the LAN via RJ-45 connectors. The pin assignment is as follows.

- **LAN1: LAN RJ45 Connectors**

PIN	Description	PIN	Description
1	TX1+	9	TX5+
2	TX1-	10	TX5-
3	TX2+	11	TX6+
4	TX3+	12	TX7+
5	TX3-	13	TX7-
6	TX2-	14	TX6-
7	TX4+	15	TX8+
8	TX4-	16	TX8-

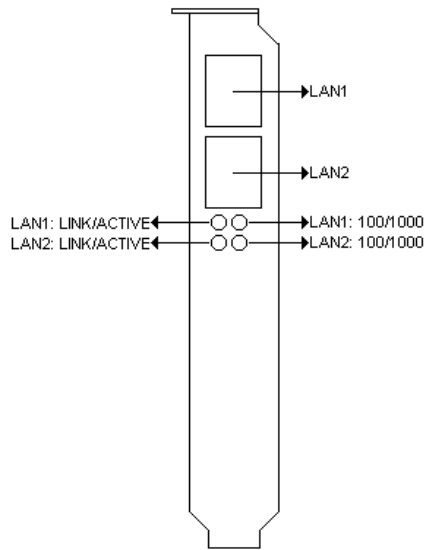
#### 1.2 LAN Wake-up Connector

Wake-Up function works while CN1 power connector is properly connected.

- **CN1: Power and Wake-up Connector**

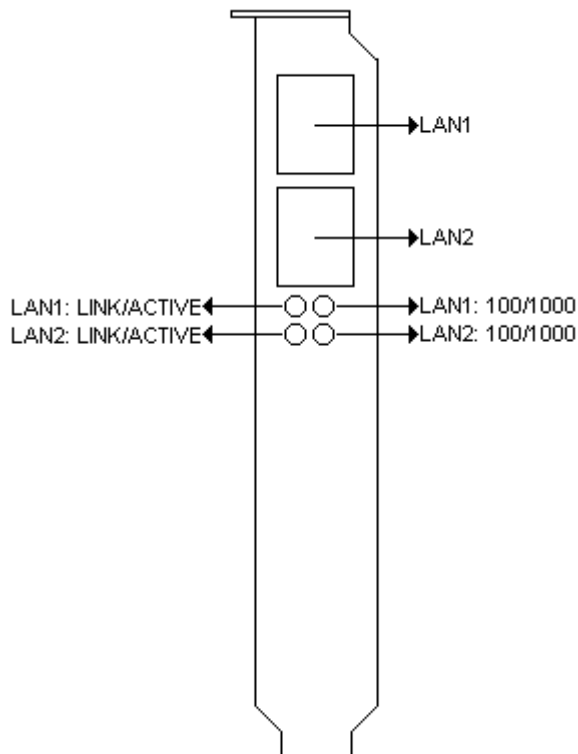
PIN	Description
1	Standby 5V
2	GROUND
3	PME#

### 1.3 MLAN-1000DBP Front Panel



### 1.4 MLAN-1000DBP LED Connector

In addition to the LED indicators of front panel, you can get the status signals from this connector.



## 1.5 State Change Setting

The power-on state can be chosen as either **Bypass State** or **Normal State** by jumper JP1. After the power is on or a PCI reset signal is issued, the LAN card will be set to default state.

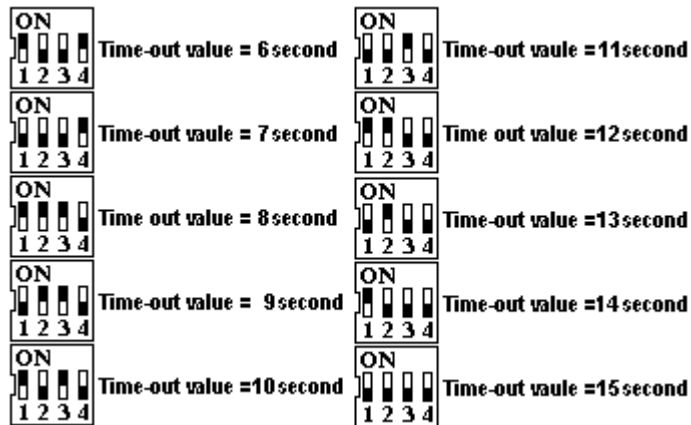
- **JP1: State Change Setting**

JP1	Description
1-2	Bypass-State
2-3 (Default)*	Normal-State (Default State)

## 1.6 WDT Time-out Value

WDT time-out value can be set as 6, 7... or 15 seconds by switch S1.

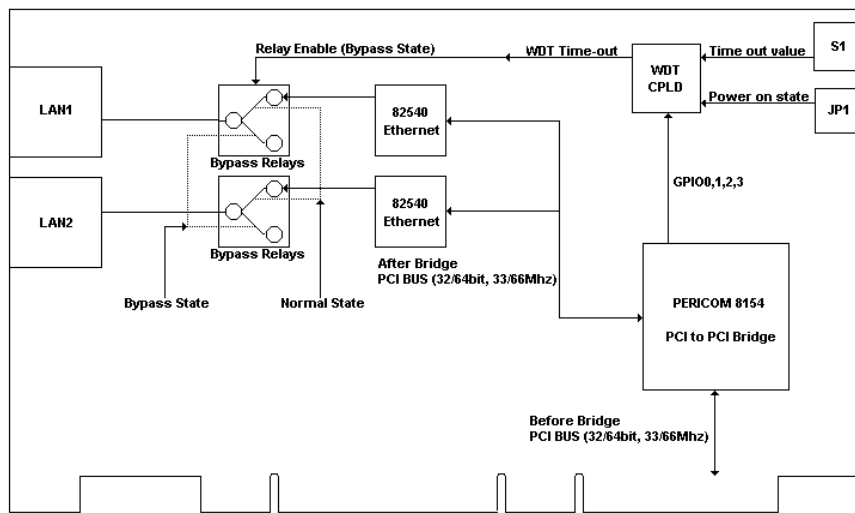
- **S1: WDT Time-out value Setting**



## 4 WDT and Bypass

The "bypass" function on MLAN-1000DBP is used to link two Ethernet ports when user's system halt or power off. "Bypass" is the native state while power is off. MLAN-1000DBP use relays for signal routing. If you want to control the operation mode, you can use the onboard Watchdog Timer and GPIO pins to switch the state between "normal" and "bypass".

### 4.1 Bypass Block Diagram



## 4.2 Programming Information of WDT

- **Search PI7C8154 PCI-to-PCI Bridge**

To program WDT, use the PI7C8154 chip information (Vendor ID = 12D8h, Device ID = 8154h) to search Mlan1000BPD card. If the card is available, record the location of the bridge (Bus number, Device number and function number) for further programming.

- **GPIO Programming on PI7C8154 chip**

GPIO0-GPIO3 pins of PI7C8154 chip are used to control the WDT. The following tables list the detailed bit mapping of 65h & 66h register.

- **Generate WDT Command**

- ✓ **Load WDT:**

- (1) Write 01h to reg #65h and 10h to reg #66h (Let GPIO0 to be low).
- (2) Write 10h to reg #65h (Let GPIO0 to be high).

- ✓ **Stop WDT:**

- (1) Write 02h to reg #65h and 20h to reg #66h (Let GPIO1 to be low).
- (2) Write 02h to reg #65h (Let GPIO1 to be high).

- ✓ **Force to Bypass:**

- (1) Write 40h to reg #65h and 04h to reg #66h (Let GPIO2 to be high).
- (2) Write 04h to reg #65h (Let GPIO2 to be low).

- ✓ **Force to Normal:**

- (1) Write 80h to reg #65h and 08h to reg #66h (Let GPIO3 to be high).

### 4.3 Installing and Uninstalling WDT

Follow the steps below to install and uninstall WDT for Windows 98, 2000, XP and NT.

1. Login as Administrator.
2. Run install.bat to install the driver.
3. Run the "WDT.exe" to check the functionality of the Watchdog Timer.
4. To integrate the WDT function into your program, please refer to the source code for "WDT.exe" in the "DEMO" directory. This demo program was built with Microsoft Visual C++ 6.0.

#### ● **Installation for Windows 98**

1. Run install.exe to install the driver.
2. Run the "WDT.exe" to check the functionality of the Watch Dog Timer.
3. To integrate the WDT function into your program, please refer to the source code for "WDT.exe" in the "DEMO" directory. This demo program was built with Microsoft Visual C++ 6.0.

#### ● **Installation for Windows 2000 / Windows XP**

1. Login as Administrator.
2. Run install.exe to install the driver.
3. Run the "WDT.exe" to check the functionality of the Watchdog Timer.
4. To integrate the WDT function into your program, please refer to the source code for "WDT.exe" in the "DEMO" directory. This demo program was built with Microsoft Visual C++ 6.0.

#### ● **Uninstalling WDT for NT4.0 / Windows 2000 / Windows XP / Windows 98**

Run Uninstall.exe to uninstall the driver.

## 4.4 WDT Library for Linux

### 1. Introduction

This is the package for MLAN1000 BPD Linux utilities, including function-testing module, library and sample testing application. The driver is registered as misc-device and the major number is fixed as 10. You can modify the start of minor number. You can also manually configure device name, support board number, and debug mode.

### 2. Configuration

--help	Show help info
--with-device=number	Max device amount support by the driver [16]
--with-minor=number	Minor number starts with the device [201]
--with-devname=name	Device name resides in the /dev/ directory [mlan]
--with-debug	Enable debugging [disable]
--prefix=path	Prefix for location of library [/usr/lib]
--with-c-compiler=cc	Program for compiling C source [guessed]

### **3. Installing WDT Library**

- I. `./configure [options...]`  
Configure WDT library before you first run this utility. It ends with an outgoing file named MCONFIG which will be included by Makefile.
- II. `%make`  
After configuration, "make" will create the driver's objective file that can be linked into kernel at runtime. A shared library for API will also be created. Note that if you select a particular directory to install the library, it must be appended to `/etc/ld.so.conf` before "make install".
- III. `%make install`  
"make install" will install the library, insert module into kernel, and parse device name to create node in `/dev/` as the entry point of the driver.
- IV. `%make testap`  
This will create an example test application.

### **4. Uninstalling WDT Library**

Run "make uninst" to delete node in `/dev/`, library, and remove module.