

***MP54GBT2 (MS-6855B)***  
***Wireless 11g + Bluetooth***  
***Combo MiniPCI Card***

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***OEM Guide***

## ***FCC Caution***

1. The 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.
2. FCC RF Radiation Exposure Statement: The equipment complies with FCC RF radiation exposure limits set forth for an uncontrolled environment.
3. This Transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.
4. Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user authority to operate the equipment.

## ***FCC Statement***

This device is intended only for OEM integrators under the following

- 1) The antenna must be installed such that 20 cm is maintained between 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 required. However, the OEM integrator is still responsible for testing end-product for any additional compliance requirements required with module installed (for example, digital device emissions, PC peripheral requirements, etc.).

## ***Important Note***

In the event that these conditions can not be example certain laptop configurations or co-location with another transmitter), then the FCC authorization is no longer considered valid the FCC ID can not be used on the final product. In these circumstances, 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 antenna may be installed such that 20 cm may be maintained between antenna and users (for example access points, routers, wireless ADSL and similar equipment). The final end product must be labeled in a area with the following: “Contains TX FCC ID: I4L-MS6855B”.

## ***Manual Information for End Users***

The end user must not have manual instructions to remove or install device. The user manual for end users 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 20 cm from all persons and must not be co-located operating in conjunction with any other antenna or transmitter.” as a result of e-mail transmission.”

## ***Important Safety Precautions***

Always read and follow these basic safety precautions carefully when handling any piece of electronic component.

1. Keep this *OEM Guide* for future reference.
2. Keep this equipment away from humidity.
3. Lay this equipment on a reliable flat surface before setting it up.
4. The openings on the enclosure are for air convection hence protects the equipment from overheating.
5. All cautions and warnings on the equipment should be noted.
6. Never pour any liquid into the opening that could damage or cause electrical shock.
7. If any of the following situations arises, get the equipment checked by a service personnel:
  - Liquid has penetrated into the equipment
  - The equipment has been exposed to moisture
  - The equipment has not work well or you can not get it work according to OEM Manual
  - The equipment has dropped and damaged
  - If the equipment has obvious sign of breakage
8. **DO NOT LEAVE THIS EQUIPMENT IN AN ENVIRONMENT UNCONDITIONED, STORAGE TEMPERATURE ABOVE 60°C OR BELOW -20°C, IT MAY DAMAGE THE EQUIPMENT.**

**“FCC RF exposure requirements:** SAR compliance has been established in the laptop computer(s) configurations as documented in this OEM Installation Manual, and can be used in laptop computer(s) with substantially similar physical dimensions, construction, and electrical and RF characteristics. Use in other devices such as PDAs or lappads is not authorized. This transmitter is restricted for use with the specific antenna(s) tested in the application for Certification. The antenna(s) used for this transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.”

# 1

## Introduction

### >>> 1.1 MP54GBT2 (MS-6855B) - Wireless 11g + Bluetooth Combo MiniPCI Card

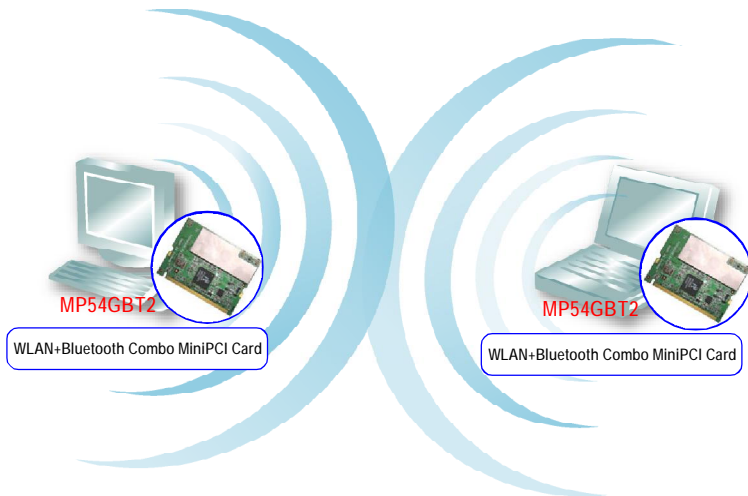
MSI MP54GBT2, the Wireless 11g + Bluetooth Combo miniPCI Card, is a **Type IIIB** card, which can be used to integrate with such systems as notebook, mini-barebone, PDA, portable PC. With MSI MP54GBT2 embedded inside, a system could provide users with the ability and flexibility to connect up to Internet wirelessly via **802.11g** with speed up to 54Mbps, and to link with peripherals wirelessly through **Bluetooth™ v2.0** and advanced **EDR (Enhanced Data Rate)** technology. **Bluetooth™ v2.0** technology increases the data rate of **Bluetooth™ v1.1/1.2** from 1.0Mbps to 2.1Mbps.

MSI MP54GBT2 is taking advantage of leading technologies from Ralink and CSR. It addresses the co-existence issues in PAN (Personal Area Network) and WLAN (Wireless Local Area Network) markets by providing true simultaneous connectivity while deploying IEEE 802.11g and Bluetooth v2.0. Along with this combo solution, a system installed with a single card is able to offer dual mode capability of WiFi and Bluetooth™. It will benefit system vendors in miniaturization of system dimension and BOM cost reduction, as well as also make users happy with the all-in-one functionality.

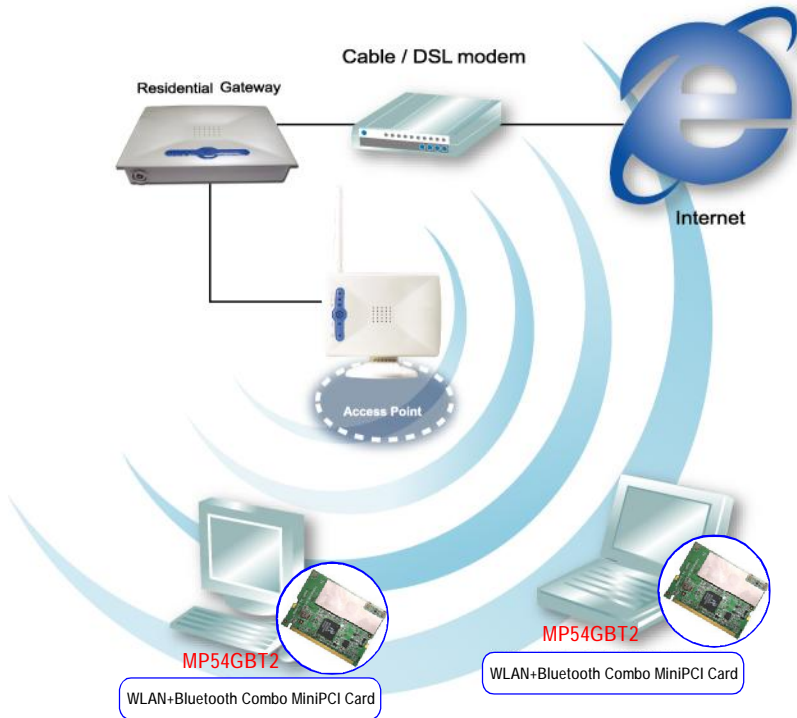
## >>> 1.2 How MP54GBT2 Works

### 1.2.1 In WLAN Environment

- **Ad-hoc Mode** : An Ad-hoc network is a local area network or other small network, especially one with wireless or temporary plug-in connections, in which some of the network devices are part of the network only for the duration of a communications session. Users in the network can share files, print to a shared printer, and access the Internet with a shared modem. In this kind of network, new devices can be quickly added; however, users can only communicate with other wireless LAN computers that are in this wireless LAN workgroup, and are within range.



- Q **Infrastructure Mode** : The difference between Infrastructure network and Ad-hoc network is that the former one includes an Access Point. In an Infrastructure network, the Access Point can manage the bandwidth to maximize bandwidth utilization. Additionally, the Access Point enables users on a wireless LAN to access an existing wired network, allowing wireless users to take advantage of the wired networks resources, such as Internet, email, file transfer, and printer sharing. The scale and range of the Infrastructure networking are larger and wider than that of the Ad-hoc networking.



## 1.2.2 In Bluetooth Connection

The term “Bluetooth” refers to a worldwide standard for the wireless exchange of data between two devices. In order to exchange data, two Bluetooth devices must establish a connection. Before a connection is established, one device must request a connection with another. The second device accepts (or rejects) the connection. The originator of the request is known as the client. The device that accepts (or rejects) the request is known as the server. Many Bluetooth devices can act as both client and server. Every Bluetooth device that provides a service must be prepared to respond to a connection request. Bluetooth software is always running in the background on the server, ready to respond to connection requests.



Bluetooth-enabled Devices



## >>> 1.3 Specifications

<b>Hardware Specification</b>	Form Factor	32-bit Type IIIB
	Operation voltage	3.3V
	Antenna Connector	Two antenna connectors
	Operating System	Microsoft® Windows® 98SE/ME/2000 /XP
	Environmental	- Operating Temperature: 0 ~ 55°C - Operating Humidity: 10 ~ 90%, non-condensing
	Dimensions (WxDxH)	59.75 x 44.6 x 3.5mm
<b>WLAN Specification</b>	Network Standard	IEEE 802.11; IEEE 802.11b/g
	Frequency Band	2.412-2.484 GHz
	Data Rate	IEEE 802.11g (auto-fallback): - OFDM: 54, 48, 36, 24, 18, 12, 9 and 6Mbps IEEE 802.11b (auto-fallback): - CCK: 11, 5.5 Mbps - DQPSK: 2 Mbps - DBPSK: 1 Mbps
	Media Access Control	CSMA/CA with ACK
	Transmission	DSSS (direct sequential spread spectrum)
	Network Architecture	Ad-Hoc Mode (Peer-to-Peer); Infrastructure Mode
	Antenna Type	Two antenna connectors support
	Power Consumption	TX peak: 380mA RX peak: 250mA Idle:5mA (TBD) Radio: disabled: TBD

Channel	<p>IEEE 802.11g: Ch. 1-11 – N. America  Ch. 1-13 – Japan  Ch. 1-13– Europe ETSI  Ch. 10-11 – Spain  Ch. 10-13 – France</p> <p>IEEE 802.11b: Ch. 1-11 – N. America  Ch. 1-13 – Japan  Ch. 1-13– Europe ETSI  Ch. 10-11 – Spain  Ch. 10-13 – France</p>
Output Power	<p>Output Power(Before Antenna)</p> <p>11b: 18dBm+/-2 Max</p> <p>11g: 14dBm+/-2 Max</p>
Receiver Sensitivity (Average Value)	<p>54 Mbps OFDM @ 10% PER = -65 dBm  48 Mbps OFDM @ 10% PER = -66 dBm  36 Mbps OFDM @ 10% PER = -70 dBm  24 Mbps OFDM @ 10% PER = -74 dBm  18 Mbps OFDM @ 10% PER = -77 dBm  12 Mbps OFDM @ 10% PER = -79 dBm  11 Mbps CCK @ 8% PER = -80 dBm  9 Mbps OFDM @ 10% PER = -81 dBm  6 Mbps OFDM @ 10% PER = -82 dBm  5.5 Mbps CCK @ 8% PER = -82 dBm  2 Mbps QPSK @ 8% PER = -83 dBm  1 Mbps BPSK @ 8% PER = -83 dBm</p>

<b>Bluetooth Specification</b>	Network Standard	Bluetooth v2.0 (Class II)
	Frequency Band	2.4-2.483 GHz
	Data Rate	Up to 2.1Mbps
	Channel	79 sub-channels
	Transmission	FHSS (Frequency Hopping Spread Spectrum)
	Modulation	GFSK
	Antenna Type	One antenna connector support
	Power Consumption	100mA (maximum, continuous TX)
	Max. Output Power	Up to 2dBm
	Max. Input Level	0dBm
	Receiver Sensitivity	-79dBm @ BER<0.1%
	Range	Up to 30 m
	Physical Links	Support ACL link
	Network Capabilities	Support piconet point-to-point and point-to multipoint connections
	Link Manager	3-slot Packets: Yes 5-slot Packets: Yes Slot Offset: Yes Timing Accuracy: Yes Switch: Yes Hold Mode: Yes Sniff Mode: Yes Test Mode: Yes Park Mode: Yes RSSI: Yes Power Control: Yes Authentication: Yes Encryption: Yes

## >>> 1.4 System Requirements

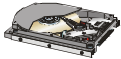
Before installing MP54GBT2, your PC should meet the following items:



- One desktop/notebook PC with an available MiniPCI slot.



- Windows® 98SE/ME/2000/XP operating system.



- Minimum 5MB free disk space for installing the driver and utilities.



- One CD-ROM drive, double speed or higher.

## >>> 1.5 Package Contents

Unpack the package and check all the items carefully. If any item contained is damaged or missing, please contact your local dealer as soon as possible. Also, keep the box and packing materials in case you need to ship the unit in the future. The package should contain the following items:



- One Wireless 11g + Bluetooth Combo MiniPCI Card.

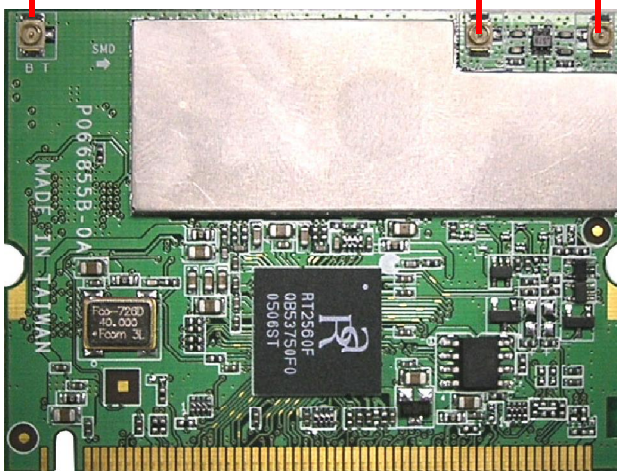


- One Installation CD-ROM including drivers, utilities, and the manual files.

## >>> 1.6 Product View

Bluetooth antenna  
Connector

WLAN 11g antenna connectors  
Connect to external antennas for  
enhanced data transmission and  
reception. The external antennas are  
well designed on the desktop or note-  
book computers.



Golden Finger

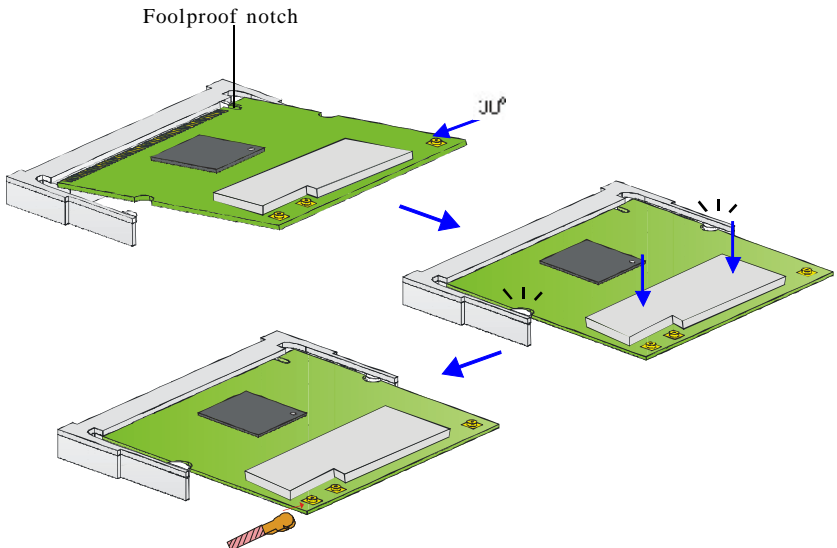
# 2

## Hardware Installation

The following diagrams provide you a basic installation for your MP54GBT2. The instruction below is suitable for most computers with MiniPCI slot. For more information about the MiniPCI module, please refer to your computer's manual.

### 🔧 Installing MP54GBT2:

1. Locate the MiniPCI slot on the mainboard. Place your MP54GBT2 over the MiniPCI slot (at an angle of 30 degrees). Then, gently insert it into the slot until the golden finger of the card gets fully inserted.
2. Press down the card, and the retaining clips (on two sides of the slot) will lock onto the notches of the card.
3. Connect the antenna's cable to the connector on the card.

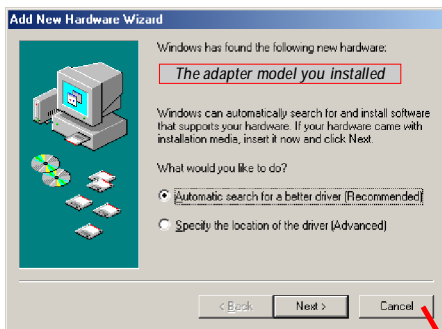


# 3

## Software Installation

This chapter describes the procedures of installing the driver and utility. Follow the instruction step by step to finish the installation. If you use Windows® 98SE/ME, please prepare the Windows® Setup CD at hand before installing the driver; because the system will ask you to insert the Setup CD to copy files during the installation.

Please **NOTE** that the MP54GBT2 should be installed into your computer before installing the driver and utility. Then, the operating system will detect a new device and start to configure the new device. Click *Cancel* here to start installation from the InstallShield Wizard.



Click

*Tip: The MP54GBT2 adapter should be installed into your PC before installing the driver and utility.*

**STEP 1**

Insert the software CD into your CD-ROM drive, and the Setup program should launch automatically.

If the Autorun program doesn't launch automatically, click **Start** at the taskbar and select **Run....** Type *E:\setup.exe* (where *E* is your CD-drive) in the Open box and click **OK** to launch the Setup program manually.

The main screen of Setup program will appear as below.

**STEP 2**

1. Click the Install WLAN Driver button.
2. The welcome screen of InstallShield Wizard appears. Click *Next*.
3. Read and accept the License Agreement; then, click *Next*.
4. Click *Install* and the program will copy the necessary files to the system. The progress indicator shows the installing status.
5. Click *Finish* when the WLAN driver installation is completed.



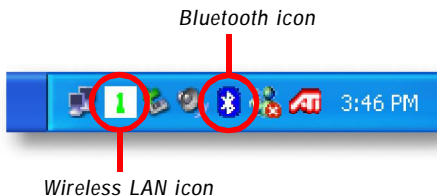
**STEP 3**

1. Click the **Install Bluetooth Driver** button.
2. The welcome screen of InstallShield Wizard appears. Click *Next*.
3. Read and accept the License Agreement; then, click *Next*.
4. Click *Next* to install the driver in the default destination folder.
5. Click *Install* and the program will copy the necessary files to the system. The progress indicator shows the installing status.
6. Click *Finish* when the bluetooth driver installation is completed.

**STEP 4**

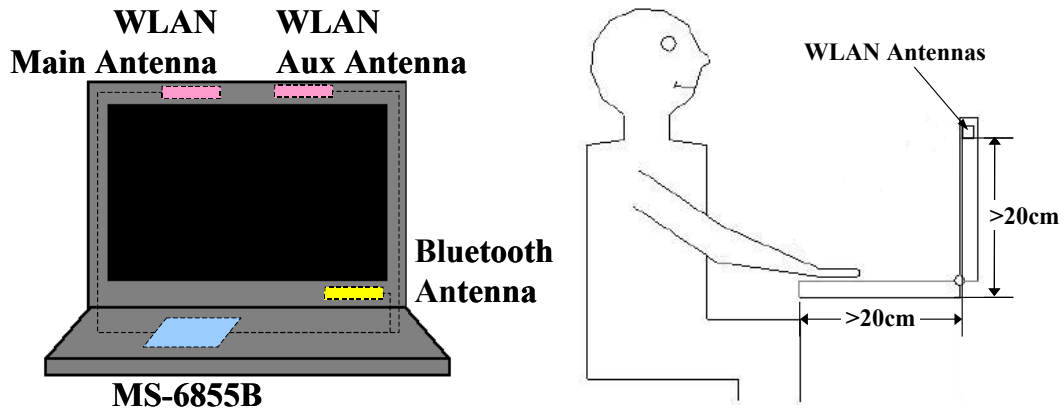
Click the **Exit** button.

The Wireless LAN icon and Bluetooth icon will appear in the status bar.



## Example of Antennas Installation

The distance between WLAN antennas and the user body (excluding hands, wrists, feet, and ankles) must be more than 20 cm. In the laptop, for example, the antennas can be located on the top of the screen. See the follows as an illustration:



### Wireless Antenna List

	Manufacturer	Model Number	Antenna Gain	Antenna type
1	High-Tek Group	MS-1002	2.99 dBi	PIFA
2	FAVORTRON	AN5	2.85 dBi	PCB
3	Well Green Technology	E12B	1.92 dBi	PIFA
4	Walsin technology	FIC	1.56 dBi	PCB
5	High-Tek Group	CLEVO 285P	0.47 dBi	PIFA
6	FAVORTRON	M300N	-2.42 dBi	PIFA
7	FAVORTRON	258KA0	0.13 dBi	PIFA
8	FOXCONN	N223	-0.06 dBi	PIFA
9	High-Tek Group	CLEVO 5600	-0.45 dBi	PIFA
10	SmartAnt	UniWill U11	-1.16 dBi	PIFA
11	High-Tek Group	MS-1013	1.5 dBi	PIFA
12	High-Tek Group	MS-1004	1.48 dBi	PIFA
13	FAVORTRON	D900T	1.82 dBi	PIFA
14	High-Tek Group	MS-1010	2.74 dBi	PIFA
15	SmartAnt	MS-1006	2.09 dBi	PIFA

### Bluetooth Antenna List

	Manufacturer	Model Number	Antenna Gain	Antenna type
1	High-Tek Group	MS-1013	1.5 dBi	PCB
2	High-Tek Group	MS-1029	1.1 dBi	PCB
3	High-Tek Group	MS-1031	-1.12 dBi	PCB