

SMT-R2000  
Users Manual

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# INTRODUCTION

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## Purpose

This manual introduces Access Point(AP)/Repeater SMT-R2000, and describes how to assemble/disassemble SMT-R2000 and troubleshoot when any failure occurs. In addition, this document describes its hardware configuration and circuits and provides the parts list for SMT-2000.

## Document Content and Organization

This manual consists of five Chapters and two Appendices.

### **CHAPTER 1. introduction of SMT-R2000**

Introduces SMT-R2000 and describes the configuration and specifications of SMT-R2000.

### **CHAPTER 2. Assembly and Disassembly** describes;

How to assemble/disassemble SMT-R2000.

### **CHAPTER 3. Troubleshooting** describes;

How to troubleshoot when any failure occurs while operating SMT-R2000.

## Conventions

The following types of paragraphs contain special information that must be carefully read and thoroughly understood. Such information may or may not be enclosed in a rectangular box, separating it from the main text, but is always preceded by an icon and/or a bold title.

|   |   |
|---|---|
|  | <b>WARNING</b><br>Provides information or instructions that the reader should follow in order to avoid personal injury or fatality. |
|---|---|

|   |   |
|---|---|
|  | <b>CAUTION</b><br>Provides information or instructions that the reader should follow in order to avoid a service failure or damage to the system. |
|---|---|

|  |  |
|--|--|
|  | <b>CHECKPOINT</b><br>Provides the operator with checkpoints for stable system operation. |
|--|--|

|   |   |
|---|---|
|  | <b>NOTE</b><br>Indicates additional information as a reference. |
|---|---|

## Revision History

| EDITION | DATE OF ISSUE | REMARKS        |
|---------|---------------|----------------|
| 00      | 12. 2005.     | Original Draft |

# FCC CONCERNS

## FCC Compliance 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 or more 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.

## RF Exposure Statement:

The antenna(s) used for this device must be installed to provide a separation distance of at least 20 cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter.

## RF Exposure Statement:

This device is restricted to indoor use only within the 5.15-5.25 GHz band to reduce any potential for harmful interference to co-channel MSS operations.

## Do not



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

# SAFETY CONCERNS

For product safety and correct operation, the following information must be given to the operator/user and shall be read before the installation and operation.

## Symbols

**Caution**

Indication of a general caution

**Restriction**

Indication for prohibiting an action for a product

**Instruction**

Indication for commanding a specifically required action



## CAUTION



**When Removes Shield Can**

When removes Shielded Can, be careful of the damage of RF terminal parts caused by heat.

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# CHAPTER 1. Introduction of SMT-R2000

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This chapter introduces SMT-R2000 and describes the configuration and specifications of SMT-R2000.

## 1.1 SMT-R2000 Overview

SMT-R2000 is a wireless LAN Access Point(AP) that is available in the construction of a wireless network and can be used as a wireless LAN repeater.

As a wireless LAN repeater, SMT-R2000 is installed within the cell area of AP or the repeater, and re-transmits the data of wireless terminals, such as wireless notebook and wireless PDA, in the outside of the cell area of neighboring AP to AP.

- AP: The AP for wireless LAN is an access device for wireless network connection and performs the relay function among wireless terminals and wired LAN. In general, the AP has a specified use area and a specific frequency.
- Repeater: If AP signal for wireless LAN is transferred over a specified distance, the output signal will be attenuated. Therefore, a device that creates new wave or raises output voltage is required to enlarge the transfer distance. To do so, the wireless LAN repeater is used as a device to restore and relay the transfer signals.

## 1.2 SMT-R2000 Configuration

This section describes the configuration of SMT-R2000.

### 1.2.1 Front Panel of SMT-R2000

The front panel of SMT-R2000 is as shown in the figure below:

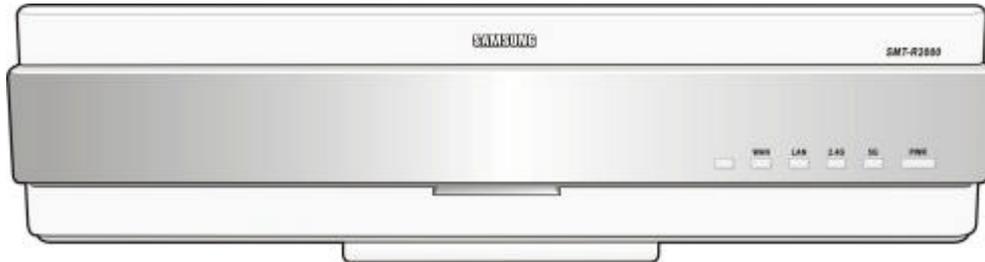


Figure 1.1 Front Panel of SMT-R2000

The following table describes each LED of the front panel:

Table 1.1 LEDs of SMT-R2000

| LED     | Function                 | Blue LED turns on                    | Blue LED turns off                   | Blue LED blinks   |
|---------|--------------------------|--------------------------------------|--------------------------------------|---|
| WAN     | WAN operation status     | WAN is in normal operation           | WAN fails to operate                 | Data is being transmitted/received through WAN                  |
| LAN     | LAN operation status     | LAN is in normal operation           | LAN fails to operate                 | Data is being transmitted/received through LAN                  |
| 2.4 GHz | 2.4 GHz operation status | 2.4 GHz Wireless LAN is in operation | 2.4 GHz Wireless LAN fail to operate | Data is being transmitted/received through 2.4 GHz Wireless LAN |
| 5 GHz   | 5 GHz operation status   | 5 GHz Wireless LAN is in operation   | 5 GHz Wireless LAN fail to operate   | Data is being transmitted/received through 5 GHz Wireless LAN   |
| PWR     | Power supply status      | Power supply is normal               | Power supply fails                   | -   |

## 1.2.2 Rear Panel of SMT-R2000

The rear panel of SMT-R2000 is as shown in the figure below:

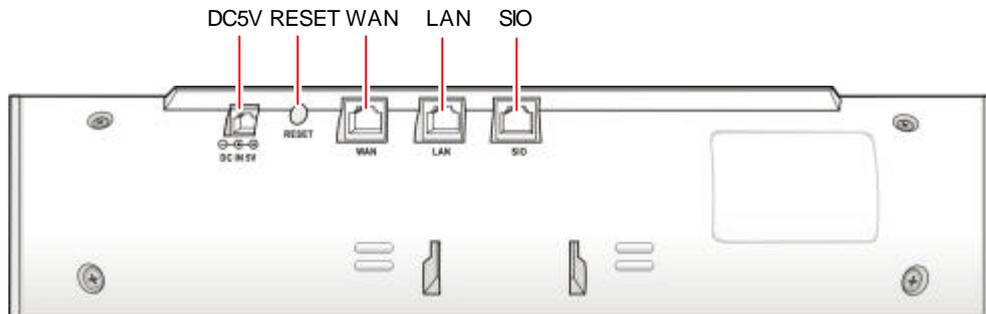


Figure 1.2 Rear Panel of SMT-R2000

The following table describes each port of the rear panel:

Table 1.2 Ports of SMT-R2000

| Port      | Function   |
|-----------|--|
| DC IN 5 V | Port for connecting to local power supply adaptor(5 V, 2 A)            |
| RESET     | External RESET input port of the system                                |
| WAN       | LAN port for connecting to WAN(RJ-45)                                  |
| LAN       | LAN port for connecting to LAN(RJ-45)                                  |
| SIO       | Used for connecting to PC to check the operational status of SMT-R2000 |

## 1.3 Hardware Specification

The SMT-R2000 hardware specification is as follows:

**Table 1.3 SMT-R2000 Hardware Specification**

| Category                        | Sub-Category                   | Item                            | Specification                          |
|---------------------------------|--------------------------------|---------------------------------|--|
| WLAN                            | IEEE 802.11a                   | Wireless Access                 | CSMA/CA                                |
|                                 |                                | Frequency                       | 5.15~5.825 Ghz                         |
|                                 |                                | Transmission Method             | OFDM                                   |
|                                 |                                | Transmission Output             | 14 dBm (25 mW) or more in 54 Mbps mode |
|                                 |                                |                                 | 15 dBm (30 mW) or more in 48 Mbps mode |
|                                 |                                |                                 | 16 dBm (50 mW) or more in 36 Mbps mode |
|                                 |                                |                                 | 17 dBm or more in other modes          |
|                                 |                                | Bandwidth                       | 20 Mhz or less                         |
|                                 |                                | Spectrum Mask                   | -20 dBr or less at Fc+/- 11 Mhz        |
|                                 |                                |                                 | -28 dBr or less at Fc+/- 20 Mhz        |
|                                 |                                |                                 | -40 dBr or less at Fc+/- 30 Mhz        |
|                                 |                                | Receive Sensitivity             | -65 dBm or less in 54 Mbps mode        |
|                                 | -82 dBm or less in 6 Mbps mode |                                 |  |
|                                 | Adjacent Channel Rejection     | -1 dB or more in 54 Mbps mode   |  |
|                                 |                                | 16 dB or more in 6 Mbps mode    |  |
|                                 | IEEE 802.11g                   | Wireless Access                 | CSMA/CA                                |
|                                 |                                | Frequency                       | 2.4~2.4835 Ghz                         |
|                                 |                                | Transmission Method             | OFDM                                   |
|                                 |                                | Transmission Output             | 14 dBm (25 mW) or more in 54 Mbps mode |
|                                 |                                |                                 | 15 dBm (30 mW) or more in 48 Mbps mode |
|                                 |                                |                                 | 16 dBm (50 mW) or more in 36 Mbps mode |
|                                 |                                |                                 | 17 dBm or more in other modes          |
|                                 |                                | Bandwidth                       | 20 Mhz or less                         |
|                                 |                                | Spectrum Mask                   | -20 dBr or less at Fc+/- 11 Mhz        |
| -28 dBr or less at Fc+/- 20 Mhz |                                |                                 |  |
| -40 dBr or less at Fc+/- 30 Mhz |                                |                                 |  |
| Receive Sensitivity             |                                | -65 dBm or less in 54 Mbps mode |  |
|                                 | -82 dBm or less in 6 Mbps mode |                                 |  |
| Adjacent Channel Rejection      | -1 dB or more in 54 Mbps mode  |                                 |  |
|                                 | 16 dB or more in 6 Mbps mode   |                                 |  |

Table 1.3 SMT-R2000 Hardware Specification (Continued)

| Category       | Sub-Category | Item                             | Specification                                    |
|----------------|--------------|----------------------------------|--|
| WLAN           | IEEE 802.11b | Wireless Access                  | CSMA/CA  |
|                |              | Frequency                        | 2.4~2.4835 Ghz                                   |
|                |              | Transmission Method              | DSSS   |
|                |              | Transmission Method              | 17 dBm or more                                   |
|                |              | Bandwidth                        | 26 Mhz or less                                   |
|                |              | Spectrum Mask                    | Primary Sidelobe: -30 bBr or less                |
|                |              | Receive Sensitivity              | -76 dBm or less(11 Mbps)                         |
| ANTENNA        | -            | Built-in ANT                     | 2 dBi Dipole ANT                                 |
|                |              | Diversity                        | Support- default                                 |
| ETHERNET       | -            | Link Speed                       | Ethernet 10/100 base -T                          |
| Power Supply   | -            | Adaptor                          | Input: 100~240 VAC, 50~60 Hz<br>Output: 5 V, 2 A |
|                |              | POE                              | Support- IEEE802.3af compliant                   |
| Bottom Case    | -            | Dimension                        | 115h x 60w x 35d(mm)                             |
|                |              | Weight                           | 148 g or less                                    |
| Environment    | Temperature  | Operational Temperature          | 0~45   |
|                |              | Storage Temperature              | -20~70   |
| Authentication | Korea        | Authentication for specification | MIC  |
|                | Europe       | Authentication for specification | CE   |
|                | U.S.A.       | Authentication for specification | FCC  |
|                | Wi-Fi        | WLAN Compatibility test          | 802.11a/b/g Radio interoperability & WPA1.0      |



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# CHAPTER 2. Assembly and Disassembly

This chapter describes how to disassemble and assemble SMT-R2000.

## 2.1 Configuration of SMT-2100C Main Board

The configuration of the SMT-R2000 main board is as shown in the figure below:

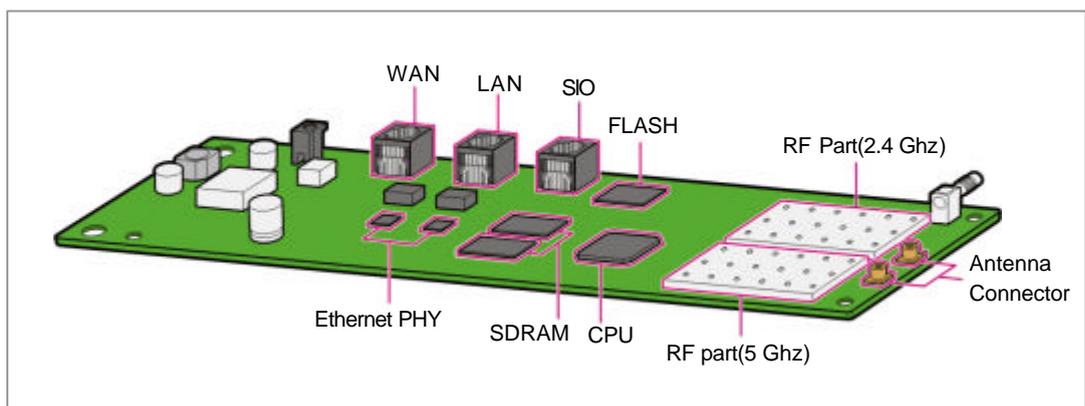


Figure 2.1 Configuration of SMT-R2000 Main Board

Table 2.1 Main Board Parts

| Item               | Description                                      |
|--------------------|--|
| WAN/LAN/SIO        | Ports for connecting to WAN/LAN/SIO              |
| FLASH              | BOOT/Application image storage memory            |
| Ethernet PHY       | PHY CHIP for connecting to Ethernet 10/100 based |
| SDRAM              | Application-operation memory                     |
| CPU                | Main processor of SMT-R2000                      |
| RF Part(2.4/5 GHz) | RF part for supporting 802.11a/b/g               |
| Antenna Connector  | Connector for connecting to built-in antenna     |

## 2.2 Disassembling

This section describes how to disassemble SMT-R2000.

The main body of SMT-R2000 is disassembled according to the following order:

### 1) Separating the Stand from the Main Body

Separate the stand from the SMT-R2000 main body.

Push off the SMT-R2000 main body and the stand in opposite directions each other, and then the stand is separated from the main body as shown in the figure below:

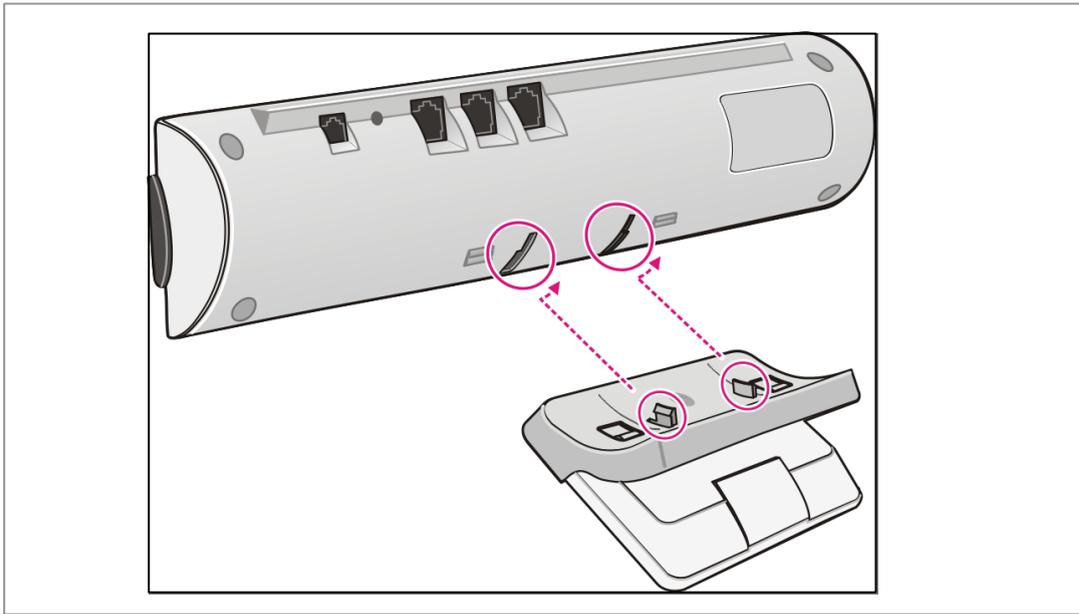


Figure 2.2 Separating the Stand

### 2) Separating the Case

Remove four screws from the bottom of the main body:

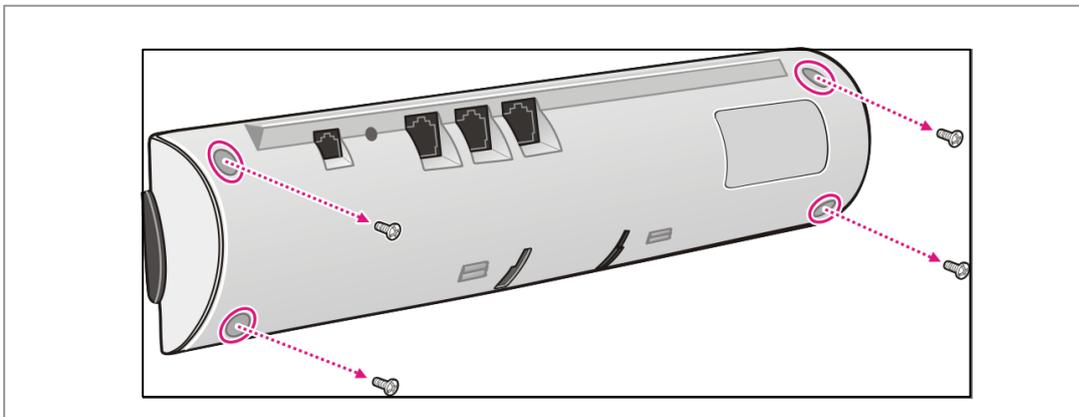


Figure 2.3 Removing Case Screws

Hold on the ends of the case in the direction of the longer sides and pull out the case in the opposite directions each other, to separate the case. The figure below shows an example that the case is separated:

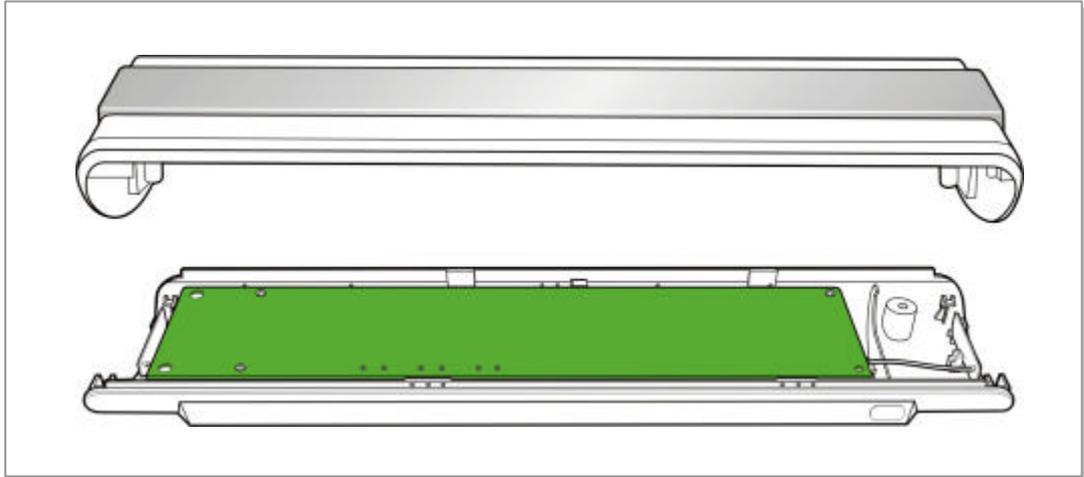


Figure 2.4 Separating the Case

### 3) Separating the Main Board and Bottom Case

Remove three screws fixing the main board and bottom case:

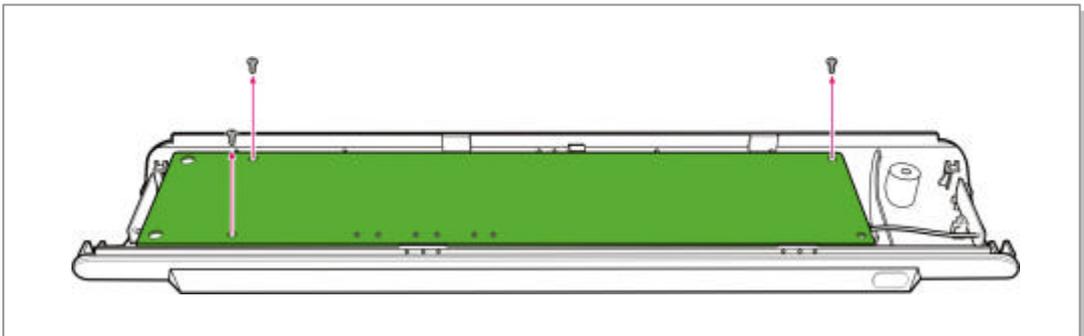


Figure 2.5 Removing Screws

Separate the antenna connector from the main board:

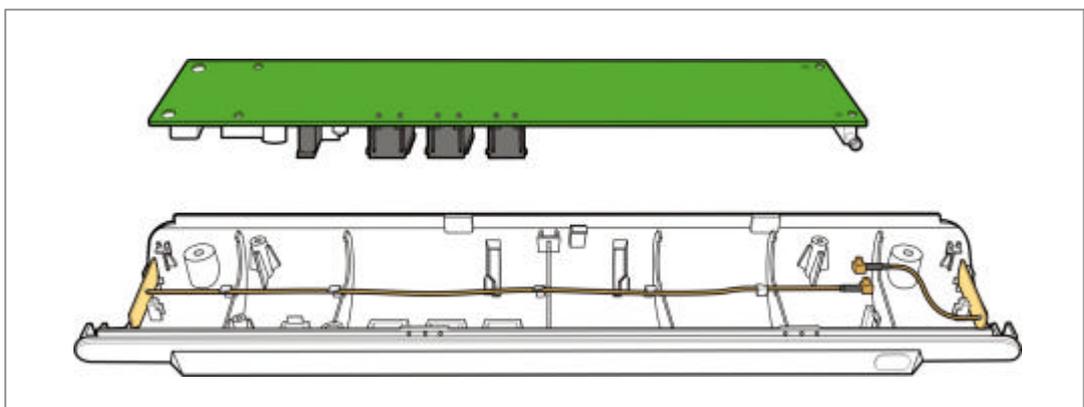


Figure 2.6 Separating the Main Board and Bottom Case

#### 4) Separating the Shield Can

Separate the shield can covering the RF block:

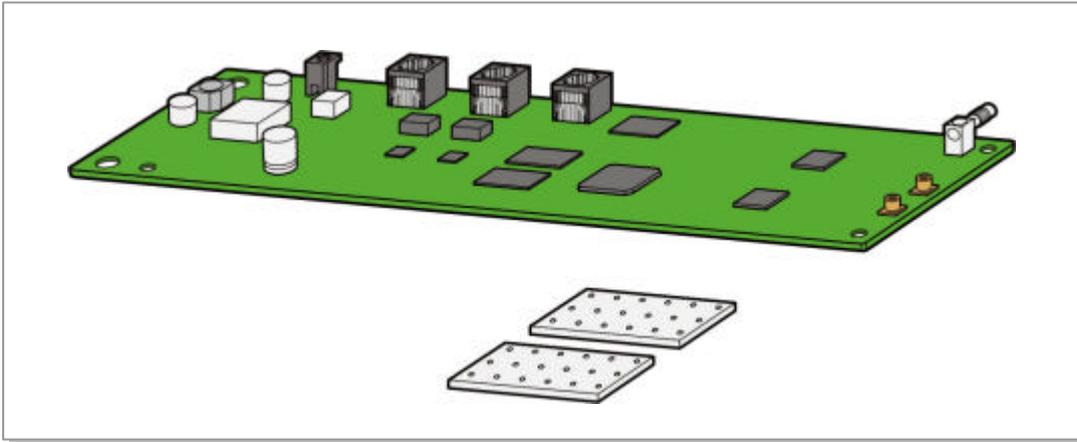


Figure 2.7 Separating the Shield Can



#### Caution in Removing the Shield Can

Take care not to damage RF parts from heat when removing the shield can.

#### 5) Separating the Antenna

Separate the antenna from the bottom case as shown in the figure below:

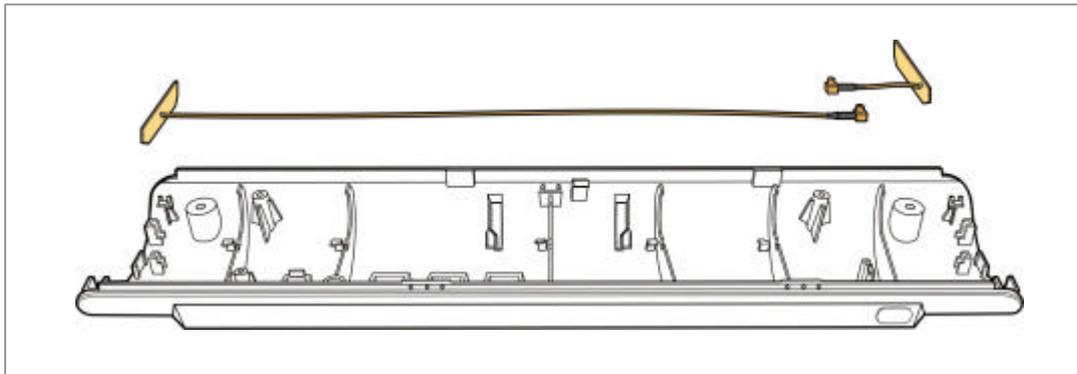


Figure 2.8 Separating the Antenna

## 6) Completing the Disassembly

The figure below shows the status that the SMT-R2000 disassembly is completed:

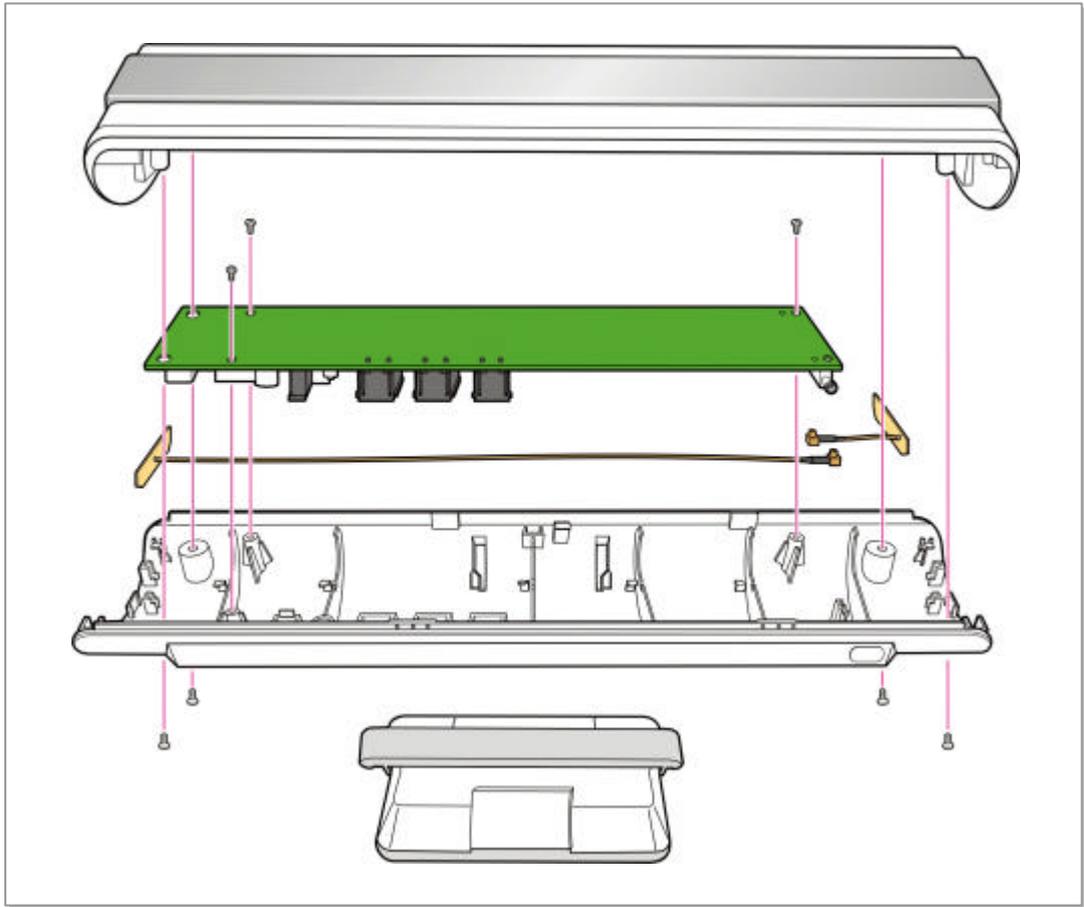


Figure 2.9 SMT-R2000 Disassembly Diagram

## 2.3 Assembling

SMT-R2000 is assembled in the reverse order of '2.1 Disassembling'.



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# CHAPTER 3. Troubleshooting

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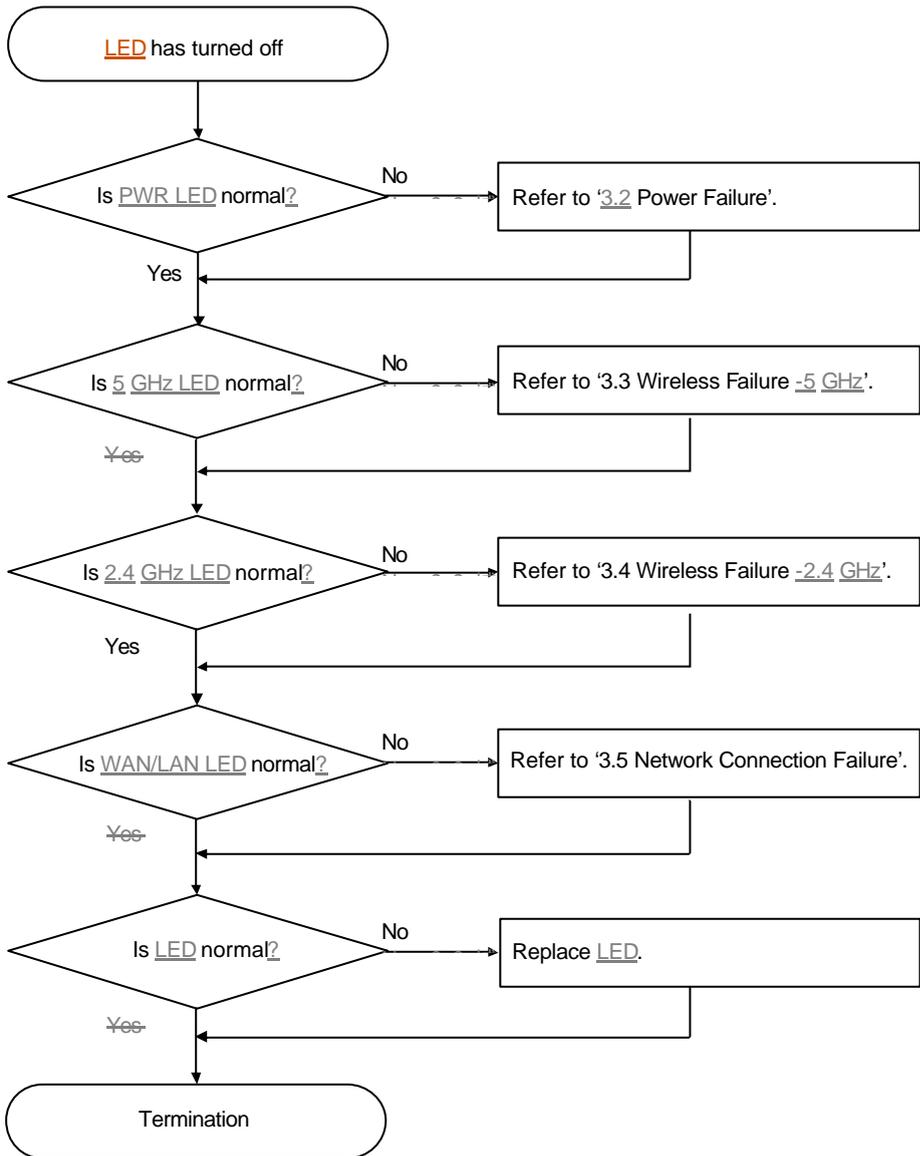
This chapter describes the troubleshooting to the failures that can occur while using SMT-R2000.

# 3.1 LED Failure

## Failure Description

Nothing is displayed on LED even though SMT-R2000 has turned on.

## Troubleshooting

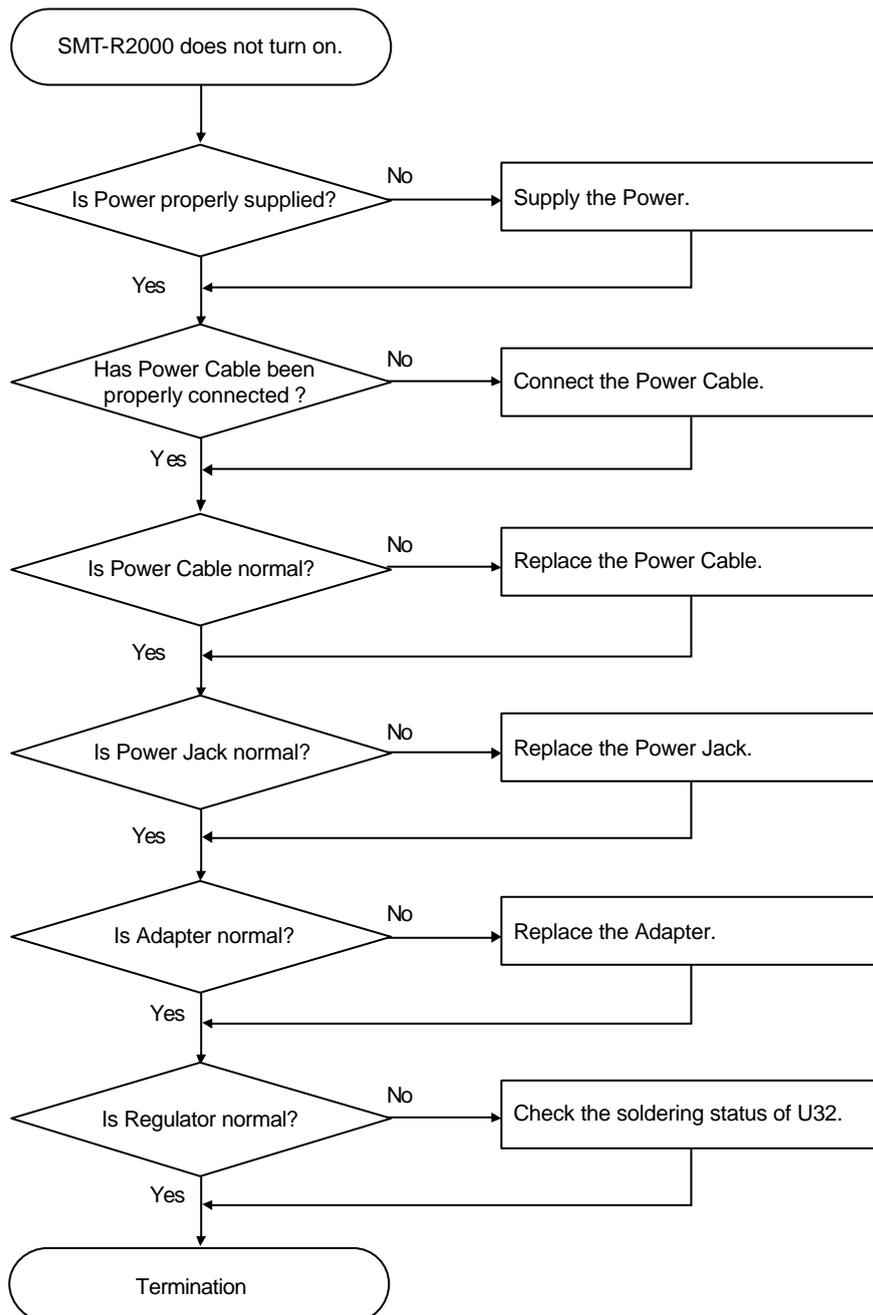


## 3.2 Power Failure

### Failure Description

SMT-R2000's body does not turn on because the power is not supplied to it.

### Troubleshooting

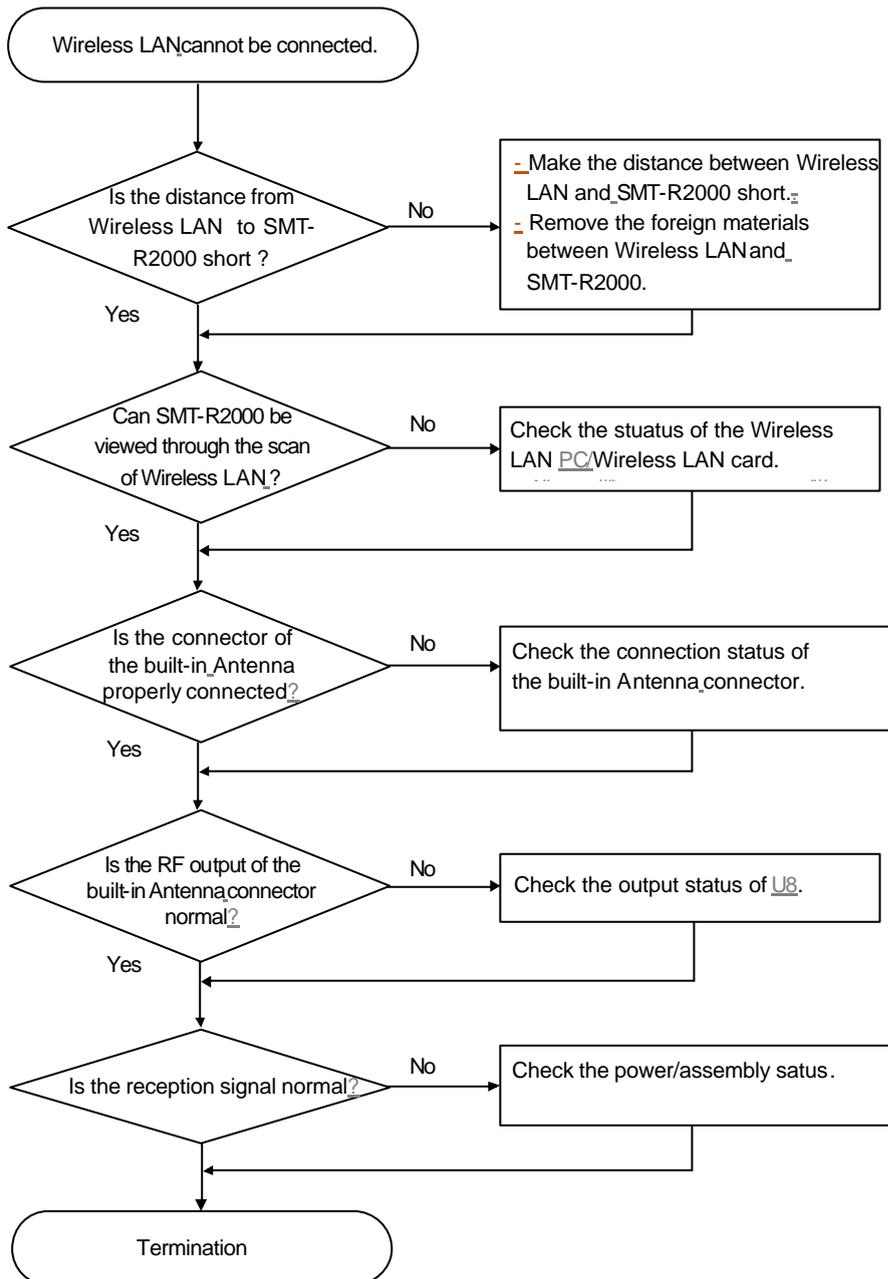


### 3.3 Wireless Failure -5 GHz

#### Failure Description

5 GHz(IEEE802.11a) Wireless LAN service cannot be used.

#### Troubleshooting

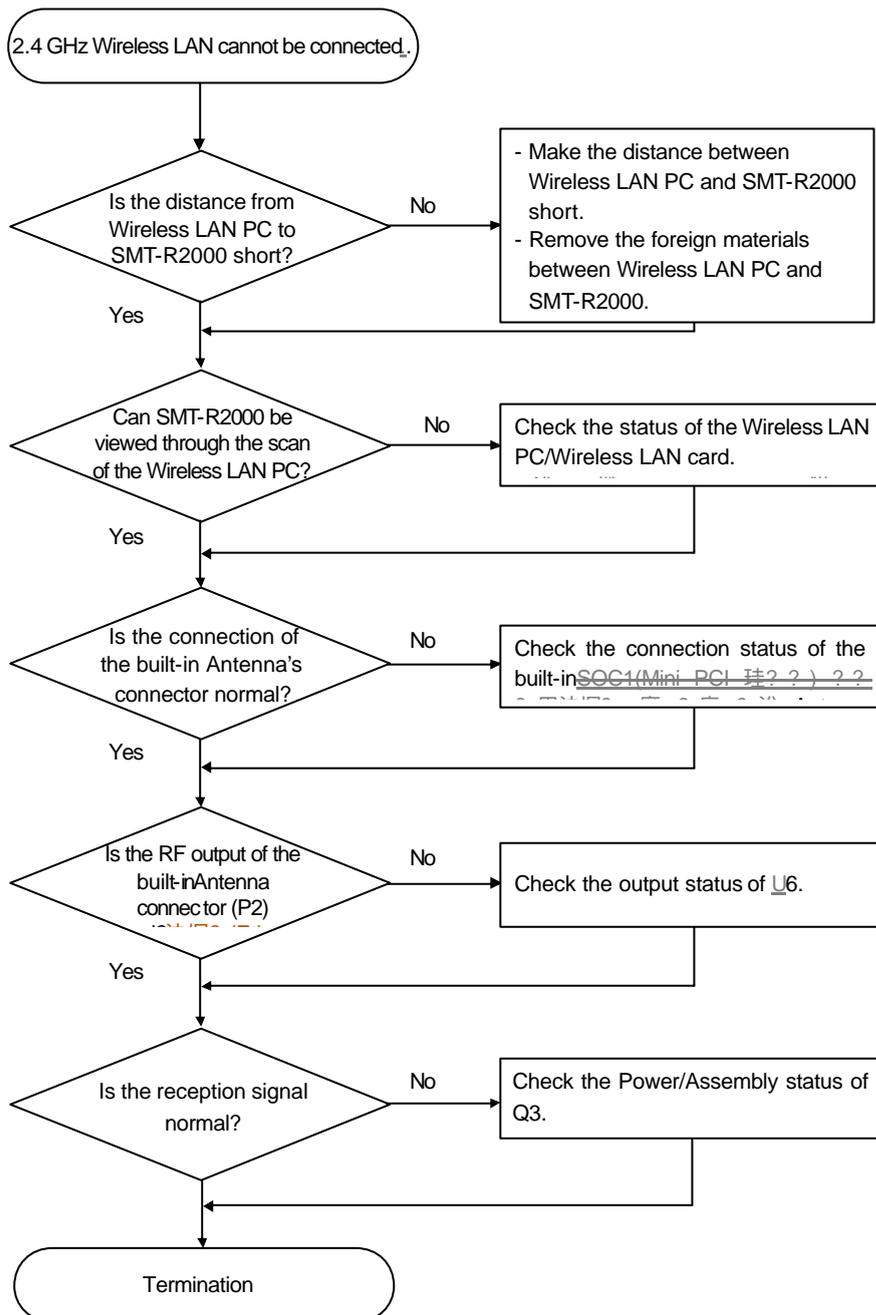


## 3.4 Wireless Failure -2.4 GHz

### Failure Description

2.4 GHz(IEEE802.11b/g) Wireless LAN service cannot be used.

### Troubleshooting



## 3.5 Network Connection Failure

### Failure Description

The access to Internet cannot be made because the connection between SMT-R2000 and Ethernet Network is not made.

### Troubleshooting

