Wireless LAN Module

(11bgn/Bluetooh Combo Module)

RICOH

DHSB-R40

User Manual

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.

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 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.

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.

Country Code selection feature to be disabled for products marketed to the US/CANADA

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,
3) For all products market in US, OEM has to limit the operation channels in CH1 to CH11 for 2.4G band by supplied firmware programming tool. OEM shall not supply any tool or info to the end-user regarding to Regulatory Domain change.

As long as 3 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

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

The final end product must be labeled in a visible area with the following: “Contains FCC ID: NKR-R40”.

Manual Information to the End User

The OEM integrator has to be aware not to provide information to the end user regarding how to install or remove this RF module in the user’s manual of the end product which integrates this module.

The end user manual shall include all required regulatory information/warning as show in this manual.

Industry Canada statement:

This device complies with Industry Canada licence-exempt RSS standard(s). Operation is subject to the following two conditions:

(1) this device may not cause interference, and

(2) this device must accept any interference, including interference that may cause undesired operation of the device.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes :

(1) l'appareil ne doit pas produire de brouillage, et

(2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

Radiation Exposure Statement:
This equipment complies with IC 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.

Déclaration d'exposition aux radiations:
Cet équipement est conforme aux limites d'exposition aux rayonnements IC établies pour un environnement non contrôlé. Cet équipement doit être installé et utilisé avec un minimum de 20 cm de distance entre la source de rayonnement et votre corps.

This device is intended only for OEM integrators under the following conditions: (For module device use)

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.

Cet appareil est conçu uniquement pour les intégrateurs OEM dans les conditions suivantes: (Pour utilisation de dispositif module)

1) L'antenne doit être installée de telle sorte qu'une distance de 20 cm est respectée entre l'antenne et les utilisateurs, et
2) Le module émetteur peut ne pas être coïmplanté avec un autre émetteur ou antenne.

Tant que les 2 conditions ci-dessus sont remplies, des essais supplémentaires sur l'émetteur ne seront pas nécessaires. Toutefois, l'intégrateur OEM est toujours responsable des essais sur son produit final pour toutes exigences de conformité supplémentaires requis pour ce module installé.

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 Canada authorization is no longer considered valid and the IC 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 Canada authorization.

NOTE IMPORTANTE:

Dans le cas où ces conditions ne peuvent être satisfaites (par exemple pour certaines configurations d'ordinateur portable ou de certaines co-localisation avec un autre émetteur), l'autorisation du Canada n'est plus considéré comme valide et l'ID IC ne peut pas être utilisé sur le produit final. Dans ces circonstances, l'intégrateur OEM sera chargé de réévaluer le produit final (y compris l'émetteur) et l'obtention d'une autorisation distincte au Canada.

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 IC:4441A-R40”.

Plaque signalétique du produit final

Ce module émetteur est autorisé uniquement pour une utilisation dans un dispositif où l'antenne peut être installée de telle sorte qu'une distance de 20cm peut être maintenue entre l'antenne et les utilisateurs. Le produit final doit être étiqueté dans un endroit visible avec l'inscription suivante: "Contient des IC: 4441A-R40".

Manual Information To the End User

The OEM integrator has to be aware not to provide information to the end user regarding how to install or remove this RF module in the user’s manual of the end product which integrates this module.

The end user manual shall include all required regulatory information/warning as show in this manual.

Manuel d'information à l'utilisateur final

L'intégrateur OEM doit être conscient de ne pas fournir des informations à l'utilisateur final quant à la façon d'installer ou de supprimer ce module RF dans le manuel de l'utilisateur du produit final qui intègre ce module.

Le manuel de l'utilisateur final doit inclure toutes les informations réglementaires requises et avertissements comme indiqué dans ce manuel.

端末機器の技術基準設計認証の認定番号
本製品は以下に認証を受けたものです。
認証機器名：DHSB-R40
認定番号： R 201-140259

Europe – EU Declaration of Conformity

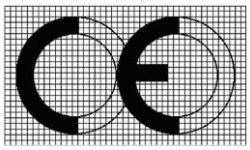
This device complies with the essential requirements of the R&TTE Directive 1999/5/EC. The following test methods have been applied in order to prove presumption of conformity with the essential requirements of the R&TTE Directive 1999/5/EC:

- EN60950-1:2006+A11:2009+A1:2010+A12:2011
- IEC60950-1:2005 (2nd Edition); Am 1:2009
  Safety of Information Technology Equipment

- EN 62311: 2008 / Article 3(1)(a) and Article 2 2006/95/EC)
- Assessment of electronic and electrical equipment related to human exposure restrictions for electromagnetic fields (0 Hz-300 GHz)

- EN 300 328 V1.8.1: 2012-06
- Electromagnetic compatibility and Radio spectrum Matters (ERM); Wideband transmission systems; Data transmission equipment operating using wide band modulation techniques; Harmonized EN covering the essential requirements of article 3.2 of the R&TTE Directive
-
- EN 301 893 V1.7.1: 2012-06
- Broadband Radio Access Networks (BRAN)
-
- EN 301 489-1 V1.9.2: 2011
- Electromagnetic compatibility and Radio spectrum Matters (ERM); ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 1: Common technical requirements
-
- EN 301 489-17 V2.2.1 2012
- Electromagnetic compatibility and Radio spectrum Matters (ERM); ElectroMagnetic Compatibility (EMC) standard for radio equipment; Part 17: Specific conditions for Broadband Data Transmission Systems
-

In Italy the end-user should apply for a license at the national spectrum authorities in order to obtain authorization to use the device for setting up outdoor radio links and/or for supplying public access to telecommunications and/or network services.



Česky	*[Jméno výrobce]* tímto prohlašuje, že tento *[typ zařízení]* je ve shodě se základními

[Czech]	požadavky a dalšími příslušnými ustanoveními směrnice 1999/5/ES.
Dansk [Danish]	Undertegnede *[fabrikantens navn]* erklærer herved, at følgende udstyr *[udstyrets typebetegnelse]* overholder de væsentlige krav og øvrige relevante krav i direktiv 1999/5/EF.
Deutsch [German]	Hiermit erklärt *[Name des Herstellers]*, dass sich das Gerät *[Gerätetyp]* in Übereinstimmung mit den grundlegenden Anforderungen und den übrigen einschlägigen Bestimmungen der Richtlinie 1999/5/EG befindet.
Eesti [Estonian]	Käesolevaga kinnitab *[tootja nimi = name of manufacturer]* seadme *[seadme tüüp = type of equipment]* vastavust direktiivi 1999/5/EÜ põhinõuetele ja nimetatud direktiivist tulenevatele teistele asjakohastele sätetele.
English	Hereby, *[name of manufacturer]*, declares that this *[type of equipment]* is in compliance with the essential requirements and other relevant provisions of Directive 1999/5/EC.
Español [Spanish]	Por medio de la presente *[nombre del fabricante]* declara que el *[clase de equipo]* cumple con los requisitos esenciales y cualesquiera otras disposiciones aplicables o exigibles de la Directiva 1999/5/CE.
Ελληνική [Greek]	ΜΕ ΤΗΝ ΠΑΡΟΥΣΑ *[name of manufacturer]* ΔΗΛΩΝΕΙ ΟΤΙ *[type of equipment]* ΣΥΜΜΟΡΦΩΝΕΤΑΙ ΠΡΟΣ ΤΙΣ ΟΥΣΙΩΔΕΙΣ ΑΠΑΙΤΗΣΕΙΣ ΚΑΙ ΤΙΣ ΛΟΙΠΕΣ ΣΧΕΤΙΚΕΣ ΔΙΑΤΑΞΕΙΣ ΤΗΣ ΟΔΗΓΙΑΣ 1999/5/ΕΚ.
Français [French]	Par la présente *[nom du fabricant]* déclare que l'appareil *[type d'appareil]* est conforme aux exigences essentielles et aux autres dispositions pertinentes de la directive 1999/5/CE.
Italiano [Italian]	Con la presente *[nome del costruttore]* dichiara che questo *[tipo di apparecchio]* è conforme ai requisiti essenziali ed alle altre disposizioni pertinenti stabilite dalla direttiva 1999/5/CE.
Latviski [Latvian]	Ar šo *[name of manufacturer / izgatavotāja nosaukums]* deklarē, ka *[type of equipment / iekārtas tips]* atbilst Direktīvas 1999/5/EK būtiskajām prasībām un citiem ar to saistītajiem noteikumiem.
Lietuvių [Lithuanian]	Šiuo *[manufacturer name]* deklaruoja, kad šis *[equipment type]* atitinka esminius reikalavimus ir kitas 1999/5/EB Direktyvos nuostatas.
Nederlands [Dutch]	Hierbij verklaart *[naam van de fabrikant]* dat het toestel *[type van toestel]* in overeenstemming is met de essentiële eisen en de andere relevante bepalingen van richtlijn 1999/5/EG.
Malti [Maltese]	Hawnhekk, *[isem tal-manifattur]*, jiddikjara li dan *[il-mudel tal-prodott]* jikkonforma mal-ħtiġijiet essenzjali u ma provvedimenti oħrajn relevanti li hemm fid-Dirrettiva 1999/5/EC.
Magyar	Alulírott, *[gyártó neve]* nyilatkozom, hogy a *[... típus]* megfelel a vonatkozó alapvetõ

[Hungarian]	követelményeknek és az 1999/5/EC irányelv egyéb elõírásainak.
pl Polski [Polish]	Niniejszym *[nazwa producenta]* oświadcza, że *[nazwa wyrobu]* jest zgodny z zasadniczymi wymogami oraz pozostałymi stosownymi postanowieniami Dyrektywy 1999/5/EC.
pt Português [Portuguese]	*[Nome do fabricante]* declara que este *[tipo de equipamento]* está conforme com os requisitos essenciais e outras disposições da Directiva 1999/5/CE.
sl Slovensko [Slovenian]	*[Ime proizvajalca]* izjavlja, da je ta *[tip opreme]* v skladu z bistvenimi zahtevami in ostalimi relevantnimi določili direktive 1999/5/ES.
Slovensky [Slovak]	*[Meno výrobcu]* týmto vyhlasuje, že *[typ zariadenia]* spĺňa základné požiadavky a všetky príslušné ustanovenia Smernice 1999/5/ES.
fi Suomi [Finnish]	*[Valmistaja = manufacturer]* vakuuttaa täten että *[type of equipment = laitteen tyyppimerkintä]* tyyppinen laite on direktiivin 1999/5/EY oleellisten vaatimusten ja sitä koskevien direktiivin muiden ehtojen mukainen.

Table of Contents

1. Introduction

Thank you for purchasing the 802.11 b/g/n / Bluetooth Combo module that provides the easiest way to wireless networking. This User Manual contains detailed instructions in the operation of this product. Please keep this manual for future reference.

System Requirements

- 128 MB of RAM or later (recommended)
- 300 MHz processor or higher

2. Driver/Utility Installation

The driver should have been installed before the Printer is shipped from the manufacturer. You can start using its network function without installing driver or utility.

This module is associated product for Printer host.
The following description provides a basic installation for wireless module.
For more information about the Wireless Module, please refer to your manual.
Installing Wi-Fi module :

1. Link cable with connector on wireless module
2. Link wireless module with connector to PC and install software in wireless module
3. Open the back lid of Printer , lock wireless module on internal main board of Printer
4. Power supply on internal main-board and allow Printer to load fully.

3. Connecting to an Existing Network

1. Use the remote control that came with your Printer to access the network configuration settings page.

2. Select the scanning wireless network function. The system starts to scan for available network. On this list, click Refresh to refresh the list at any time

3. Select the network you want to connect to.

4. If the chosen network has security enabled, you will have to setup corresponding security

parameter. Contact the network manager for the correct settings. Select the security type and fill in required parameters. The options include the following:

- WPA/WPA2/CCKM
- WPA/WPA2 Passphrase
- 802.1x
- Pre-Shared Key (Static WEP)
- None

4. Modifying a Wireless Network

4.1 Modifying General Settings

1. Use the remote control that came with your Printer to access the network configuration settings page.
2. From the profile list, select one profile and choose the modify function.
3. Modify the settings below for your network.

Profile Name	Identifies the configuration wireless network profile. This name must be unique. Profile names are not case sensitive.
Client Name	Identifies the client machine.
Use this profile for Access Point mode	Configures station to operate in Access Point mode.
Network Names (SSIDs)	The IEEE 802.11 wireless network name. This field has a maximum limit of 32 characters. Configure up to three SSIDs (SSID1, SSID2, and SSID3).

4.2 Modifying Security Settings

1. Use the remote control that came with your Printer to access the network configuration settings page.
2. Select a security option of this wireless network. This product provides security options below. Contact your wireless network administrator for choosing a correct option.

   - WPA/WPA2/CCKM
   - WPA/WPA2 Passphrase
   - 802.1x
   - Pre-Shared Key (Static WEP)
   - None

WPA/WPA2	Enables the use of Wi-Fi Protected Access (WPA). Choosing WPA/WPA2 opens the WPA/WPA2 EAP drop-down menu. The options include: ● EAP-FAST ● EAP-TLS ● EAP-TTLS ● EAP-SIM ● PEAP (EAP-GTC) ● PEAP (EAP-MSCHAP V2) ● LEAP
WPA/WPA2 Passphrase	Enables WPA/WPA2 Passphrase security. Click on the Configure button and fill in the WPA/WPA2 Passphrase.
802.1x	Enables 802.1x security. This option requires IT administration. Choosing 802.1x opens the 802.1x EAP type drop-down menu. The options include: ● EAP-FAST ● EAP-TLS ● EAP-TTLS ● EAP-SIM ● PEAP (EAP-GTC) ● PEAP (EAP-MSCHAP V2) ● LEAP
Pre-Shared Key (Static WEP)	Enables the use of pre-shared keys that are defined on both the access point and the station. To define pre-shared encryption keys, choose the Pre-Shared Key radio button and click the Configure button to fill in the Define Pre-Shared Keys window.

None	No security (not recommended).
Allow Association to Mixed Cells	Check this check box if the access point with which the client adapter is to associate has WEP set to Optional and WEP is enabled on the client adapter. Otherwise, the client is unable to establish a connection with the access point.
Limit Time for Finding Domain Controller To	Check this check box and enter the number of seconds (up to 300) after which the authentication process times out when trying to find the domain controller. Entering zero is like unchecking this check box, which means no time limit is imposed for finding the domain controller. Note: The authentication process times out whenever the authentication timer times out or the time for finding the domain controller is reached.
Group Policy Delay	Specify how much time elapses before the Windows logon process starts group policy. Group policy is a Windows feature used by administrators to specify configuration options for groups of users. The objective is to delay the start of Group Policy until wireless network authentication occurs. Valid ranges are from 0 to 65535 seconds. The value that you set goes into effect after you reboot your computer with this profile set as the active profile. This drop-down menu is active only if you chose EAP-based authentication.

4. Specifications

WiFi :

<table>
<tr><th>Item</th><th>Key specifications</th></tr>
<tr><td>Main chipset</td><td>➢ BROADCOM BCM43340</td></tr>
<tr><td>TX/RX</td><td>➢ 1T1R</td></tr>
<tr><td>Frequency range</td><td>➢ 2.400 ~ 2.4835 GHz</td></tr>
<tr><td>Host interface</td><td>➢ SDIO V2.0</td></tr>
<tr><td>Channel spacing</td><td>➢ 5MHz</td></tr>
<tr><td>Operation voltage</td><td>➢ 3.3V +/- 9%</td></tr>
<tr><td>Power consumption @3.3V and 25 ° C</td><td>
<table>
<tr><th rowspan="2">Description</th><th rowspan="2">Tarhet Power</th><th colspan="2">3.3V</th><th rowspan="2">Unit</th></tr>
<tr><th>AVG</th><th>MAX</th></tr>
<tr><td>Driver disabled</td><td>N/A</td><td>9.7</td><td>20</td><td>mA</td></tr>
<tr><td>TX CCK , 1M</td><td>18</td><td>380.7</td><td>411</td><td>mA</td></tr>
<tr><td>TX CCK , 11M</td><td>18</td><td>369.9</td><td>409</td><td>mA</td></tr>
<tr><td>TX OFDM , 6M</td><td>16</td><td>322.7</td><td>367</td><td>mA</td></tr>
<tr><td>TX OFDM , 54M</td><td>15</td><td>307.3</td><td>355</td><td>mA</td></tr>
<tr><td>TX HT20 , MCS 0</td><td>16</td><td>318</td><td>345</td><td>mA</td></tr>
<tr><td>TX HT20 , MCS 7</td><td>13</td><td>262.1</td><td>308</td><td>mA</td></tr>
<tr><td>TX HT40 , MCS 0</td><td>16</td><td>308.3</td><td>355</td><td>mA</td></tr>
<tr><td>TX HT40 , MCS 7</td><td>13</td><td>259</td><td>304</td><td>mA</td></tr>
</table>
Note : The maximum current consumption would be impacted by radiation environment and the driver mechanism.
</td></tr>
</table>

PCB dimension	➢ **35+/-0.15mm x 15.00+/-0.15mm 6L FR4**
Operation temperature	➢ $-10^{o} \sim 60^{o}$ C
Storage temperature	➢ $-20^{o} \sim 85^{o}$ C , R.H. : 90%
Antenna	➢ 1 PCB Antennas on module with peak gain of 0.79 dBi.

Bluetooth :

<table>
<tr><th>Item</th><th>Key specifications</th></tr>
<tr><td>Main chipset</td><td>➢ Broadcom BCM43340</td></tr>
<tr><td>Compliance</td><td>➢ Bluetooth v4.0 with BLE</td></tr>
<tr><td>Frequency range</td><td>➢ 2.400 ~ 2.4835GHz</td></tr>
<tr><td>Initial carrier frequency tolerance</td><td>➢ +/- 40kHz (typical)</td></tr>
<tr><td>Modulation technique</td><td>➢ Frequency hopping, 1600 hops/sec</td></tr>
<tr><td>Channel spacing</td><td>➢ 1MHz</td></tr>
<tr><td>Channels support</td><td>➢ 79 channels</td></tr>
<tr><td>Host interface</td><td>➢ UART Interface</td></tr>
<tr><td>Power consumption @25° C</td><td>
<table>
<tr><td></td><td>Avg (mA)</td><td>Max (mA)</td></tr>
<tr><td>Idle mode</td><td>12.6</td><td>21</td></tr>
<tr><td>Continuous DH5 TX</td><td>12.9</td><td>72.6</td></tr>
<tr><td>Continuous 2DH5 TX</td><td>12</td><td>58.2</td></tr>
<tr><td>Continuous 3DH5 TX</td><td>11.8</td><td>59.7</td></tr>
<tr><td>Inquiry Scan</td><td>15.8</td><td>40.6</td></tr>
</table>
***The maximum current consumption would be impacted by radiation environment and the driver mechanism.
</td></tr>
<tr><td>Output Power</td><td></td></tr>
</table>

(dBm)	➢ **5 dBm typical, class 1.5 device （5 dBm < output power < 10 dBm）.** **BT output Power by FW adjust**
Sensitivity	➢ **-85 dBm (typ.) for pi/4-DQPSK, 0.1%BER**
Operation temperature	➢ **-10° ~ 60° C**
Storage temperature	➢ **-20° ~ 80° C ,** R.H. : 90%

Antenna Information

For BT:

Type	Printed ANT
Peak Gain(dBi)	0.79
Connector	NA

For Wi Fi:

Type	Printed ANT
Peak Gain(dBi)	0.79
Connector	NA