

# **Wireless LAN Module (11abgn/ac Bluetooth Combo Module)**

**DHSR-SY30**

## **User Manual**

### **Copyright Statement**

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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.

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:**

#### **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

Operation of this device is restricted to indoor use only

**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**

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 FCC ID: NKR-SY30".

**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.

Ant. No.	Model	Type	Connector	Frequency band (MHz) / Antenna Gain (dBi)				
				2400~2483.5	5150~5250	5250~5350	5470~5725	5725~5850
1	Antenna 1 (Green PCB, Cable 1)	Dipole	UFL	0.21	-2.06	-0.99	-0.01	-0.95
	<b>Antenna 1 (Green PCB, Cable 1)</b>	<b>Dipole</b>	<b>UFL</b>	<b>0.69</b>	<b>-1.33</b>	<b>-0.28</b>	<b>0.7</b>	<b>-0.21</b>
2	Antenna 2 (Blue PCB, Cable 2)	Dipole	UFL	1.25	1.39	1.39	1.48	-0.3
	<b>Antenna 2 (Blue PCB, Cable 2)</b>	<b>Dipole</b>	<b>UFL</b>	<b>2.33</b>	<b>3.1</b>	<b>3.14</b>	<b>3.14</b>	<b>1.84</b>

Frequency Tolerance: 10.23 ppm

Compliance with FCC requirement 15.407(c)

Data transmission is always initiated by software, which is the passed down through the MAC, through the digital and analog baseband, and finally to the RF chip. Several special packets are initiated by the MAC.

These are the only ways the digital baseband portion will turn on the RF transmitter, which it then turns off at the end of the packet.

Therefore, the transmitter will be on only while one of the aforementioned packets is being transmitted. In other words,

this device automatically discontinue transmission in case of either absence of information to transmit or operational failure.

## Industry Canada statement:

This device complies with Industry Canada's applicable licence-exempt RSSs. 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;
- 2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

*This radio transmitter (IC: 4441A-SY30) has been approved by Industry Canada to operate with the antenna types listed below with the maximum permissible gain indicated. Antenna types not included in this list, having a gain greater than the maximum gain indicated for that type, are strictly prohibited for use with this device.*

*Le présent émetteur radio (IC: 4441A-SY30) a été approuvé par Industrie Canada pour fonctionner avec les types d'antenne énumérés ci-dessous et ayant un gain admissible maximal. Les types d'antenne non inclus dans cette liste, et dont le gain est supérieur au gain maximal indiqué, sont strictement interdits pour l'exploitation de l'émetteur.*

Ant. No.	Model	Type	Connector	Frequency band (MHz) / Antenna Gain (dBi)				
				2400~2483.5	5150~5250	5250~5350	5470~5725	5725~5850
1	Antenna 1 (Green PCB, Cable 1)	Dipole	UFL	0.21	-2.06	-0.99	-0.01	-0.95
	<b>Antenna 1 (Green PCB, Cable 1)</b>	<b>Dipole</b>	<b>UFL</b>	<b>0.69</b>	<b>-1.33</b>	<b>-0.28</b>	<b>0.7</b>	<b>-0.21</b>
2	Antenna 2 (Blue PCB, Cable 2)	Dipole	UFL	1.25	1.39	1.39	1.48	-0.3
	<b>Antenna 2 (Blue PCB, Cable 2)</b>	<b>Dipole</b>	<b>UFL</b>	<b>2.33</b>	<b>3.1</b>	<b>3.14</b>	<b>3.14</b>	<b>1.84</b>

**Caution:**

(i) the device for operation in the band 5150–5250 MHz is only for indoor use to reduce the potential for harmful interference to co-channel mobile satellite systems;

(ii) for devices with detachable antenna(s), the maximum antenna gain permitted for devices in the bands 5250-5350 MHz and 5470-5725 MHz shall be such that the equipment still complies with the e.i.r.p. limit;

(iii) for devices with detachable antenna(s), the maximum antenna gain permitted for devices in the band 5725-5850 MHz shall be such that the equipment still complies with the e.i.r.p. limits specified for point-to-point and non-point-to-point operation as appropriate; and

Operations in the 5.25-5.35GHz band are restricted to indoor usage only.

**Avertissement:**

(i) les dispositifs fonctionnant dans la bande de 5150 à 5250MHz sont réservés uniquement pour une utilisation à l'intérieur afin de réduire les risques de brouillage préjudiciable aux systèmes de satellites mobiles utilisant les mêmes canaux;

(ii) pour les dispositifs munis d'antennes amovibles, le gain maximal d'antenne permis pour les dispositifs utilisant les bandes de 5250 à 5350MHz et de 5470 à 5725 MHz doit être conforme à la limite de la p.i.r.e;

(iii) pour les dispositifs munis d'antennes amovibles, le gain maximal d'antenne permis (pour les dispositifs utilisant la bande de 5725 à 5850 MHz) doit être conforme à la limite de la p.i.r.e. spécifiée pour l'exploitation point à point et l'exploitation non point à point, selon le cas;

Les opérations dans la bande de 5.25-5.35GHz sont limités à un usage intérieur seulement.

**Radiation Exposure Statement:**

This equipment complies with Canada 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 Canada limites d'exposition aux radiations dans un environnement non contrôlé. Cet équipement doit être installé et utilisé à distance minimum de 20cm entre le radiateur et votre corps.

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

1) The transmitter module may not be co-located with any other transmitter or antenna.

As long as 1 condition 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:**

1) Le module émetteur peut ne pas être coïmplanté avec un autre émetteur ou antenne.

Tant que les 1 condition 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 number 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**

The final end product must be labeled in a visible area with the following: "Contains IC: 4441A-SY30.

## **Plaque signalétique du produit final**

Le produit final doit être étiqueté dans un endroit visible avec l'inscription suivante: "Contient des IC: 4441A-SY30.

## **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.

Data transmission is always initiated by software, which is the passed down through the MAC, through the digital and anaog baseband, and finally to the RF chip. Several special packets are initiated by the MAC. These are the only ways the digital baseband portion will turn on the RF transmitter, which it then turns off at the end of the packet. Therefore, the transmitter will be only while one of the aforementioned packets is being transmitted. In other words, this device automatically discontinue transmission in

La transmission des données est toujours initiée par le logiciel, puis les données sont transmises par l'intermédiaire du MAC, par la bande de base numérique et analogique et, enfin, à la puce RF. Plusieurs parquets Spéciaux sont initiés par le MAC. Ce sont les seuls moyens pour qu'une partie de la bande de base numérique active l'émetteur RF, puis désactive celui-ci à la fin du paquet. En conséquence, l'émetteur reste uniquement active lors de la transmission d'un des paquets susmentionnés. En d'autres termes, ce dispositif interrompt automatiquement toute transmission en cas d'absence d'information à transmettre ou de défaillance.

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## **1. INTRODUCTION**

Thank you for purchasing the 802.11 a/b/g/n /ac and 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 audio device is shipped from the manufacturer. You can start using its network function without installing driver or utility.

## **3. Connecting to an Existing Network**

1. Use the remote control that came with your audio device 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 audio device 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 audio device 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

<b>WPA/WPA2</b>	<p>Enables the use of Wi-Fi Protected Access (WPA). Choosing WPA/WPA2 opens the WPA/WPA2 EAP drop-down menu. The options include:</p> <ul style="list-style-type: none"> <li>• EAP-FAST</li> <li>• EAP-TLS</li> <li>• EAP-TTLS</li> <li>• EAP-SIM</li> <li>• PEAP (EAP-GTC)</li> <li>• PEAP (EAP-MSCHAP V2)</li> <li>• LEAP</li> </ul>
<b>WPA/WPA2 Passphrase</b>	<p>Enables WPA/WPA2 Passphrase security. Click on the Configure button and fill in the WPA/WPA2 Passphrase.</p>
<b>802.1x</b>	<p>Enables 802.1x security. This option requires IT administration. Choosing 802.1x opens the 802.1x EAP type drop-down menu. The options include:</p> <ul style="list-style-type: none"> <li>• EAP-FAST</li> <li>• EAP-TLS</li> <li>• EAP-TTLS</li> <li>• EAP-SIM</li> <li>• PEAP (EAP-GTC)</li> <li>• PEAP (EAP-MSCHAP V2)</li> <li>• LEAP</li> </ul>
<b>Pre-Shared Key (Static WEP)</b>	<p>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 <u>Define Pre-Shared Keys window</u>.</p>

<b>None</b>	No security (not recommended).
<b>Allow Association to Mixed Cells</b>	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.
<b>Limit Time for Finding Domain Controller To</b>	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.
<b>Group Policy Delay</b>	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.