

222, LG-ro, Jinwi-myeon, Pyeongtaek-si, Gyeonggi-do 451-713 Korea

# RS4

# **Wireless Adapter Card**

# **User Guide**

Version 1.1

June., 2014



## 222, LG-ro, Jinwi-myeon, Pyeongtaek-si, Gyeonggi-do 451-713 Korea

## **Revision History**

Release	Date	Revision	Initials
1.1	2014-06-06	First release.	

LG Electronics

222, LG-ro, Jinwi-myeon, Pyeongtaek-si, Gyeonggi-do 451-713 Korea

## **STATEMENT** and Warning



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. 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 transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

## FCC RF 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.

# IC

This device complies with Industry Canada license-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.

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 and your body.

#### French:

Cet appareil radio est conforme au CNR-210 d'Industrie Canada. L'utilisation de ce dispositif est autorisée seulement aux deux conditions suivantes : (1) il ne doit pas produire de brouillage, et (2) l'utilisateur du dispositif doit être prêt à accepter tout brouillage radioélectrique reçu, même si ce brouillage est susceptible de compromettre le fonctionnement du dispositif.

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.

LG Electronics

222, LG-ro, Jinwi-myeon, Pyeongtaek-si, Gyeonggi-do 451-713 Korea

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

- The antenna must be installed such that 20 cm is maintained between the antenna and users, and
- 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

**IMPORTANT NOTE:** In the event that these conditions <u>can not be met</u> (for example certain laptop configurations or co-location with another transmitter), then the FCC authorization is no longer considered valid and the FCC ID cannot 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: BEJ9QK-DMRS4", "contains IC: 2703H-DMRS4". The grantee's FCC ID can be used only when all FCC/ IC compliance requirements are met.

#### 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.

LG Electronics

222, LG-ro, Jinwi-myeon, Pyeongtaek-si, Gyeonggi-do 451-713 Korea

# CE

Hereby declares that this WiFi module is in compliance with the essential requirements and other relevant provisions of R&TTE Directive 1999/5/EC. The standards for complying are as following:

ETSI EN 301 489-1 V1.9.2: 2011-09 ETSI EN 301 489-17 V2.2.1: 2012-09 ETSI EN 300 328 V1.8.1:2012-06 ETSI EN 301 893 V1.7.1: 2012-06 EN 62311: 2008 EN 60950-1:2006+A11:2009+A1:2010+A12:2011

# **CE**0984

This is a class B product. In a domestic environment, this product may cause radio interference, in which case the user may be required to take adequate measures.

This is a class B product. In a domestic environment, this product may cause radio interference, in which case the user may be required to take adequate measures.

National Restrictions

This device is intended for home and office use in all EU countries (and other countries following the EU directive 1999/5/EC).

## CONTENTS

Package Contents7			
Chapter 1	Introduction	8	
1.1	Overview of the Product	8	
1.2	Features	8	
Chapter 2	hapter 2 Linux Installation Guide (For Consumer Electronics)		
-	Hardware Installation	9	
2.1			

#### RS4

## Package Contents

The following items should be found in your package:

> RS4 Wireless Adapter Card

### **Conventions:**

The 'Module' mentioned in this user guide stands for PW-MN5275 WLAN Adapter Card without any explanation.

#### RS4

## **Chapter 1 Introduction**

Thank you for choosing the RS4 Wireless Adapter Card!

#### **1.1** Overview of the Product

The Module is an OEM module (35x35mm) based on the IA3S4. It is a compressed wireless digital audio transceiver operating in the 2.4GHz bands. The wireless audio link supports 1 stereo audio stream and comes together with additional features such as: pairing functionality, seamless and bidirection transmission of high quality audio, I2S sampling frequency detection, support Sleep mode, Programmable end-to-end audio latency, Control Channel ability, support no audio detection,

Robust packet error correction.

#### P Note:

The RS4 is designed to be used inside consumer electronic products, such as TV, Blue-Ray, Home Theater, etc.

#### 1.2 Features

- > 2.4GHz band
- ➢ GFSK digital modulation
- Support 1-1 duplex mode or 1-N broadcasting mode
- I2S digital audio interfaces
- > Audio format 16bit, 32/44.1/48KHz sampling rate
- I2C control with external device
- Support no audio detection function
- Robust packet error correction
- Low power consumption
- Low audio delay time < 20ms</p>

## Chapter 2 Linux Installation Guide (For Consumer Electronics)

RS4

### 2.1 Hardware Installation

For the Consumer Electronics products which use RS4, it must provide a corresponding connector for the module. After connecting the module to the device, the hardware installation is finished.

## 2.2 Software Installation

For the Consumer Electronics products, the Linux Driver of RS4 is embedded in default. So the module is a plug and play device. After connecting the module to the device, RS4 will work well.

### 2.3 Pin Definitions

1VCIOPWRVC supply2KDDGNDGND4KDGNDGND4KDGNDGND5KD_LEDJOGPO6NCJOGPO7NCJOSED7NCJOSED8SDATAJOSeD9GNDGNDGND9GNDGNDGND10SCATAJOSed11SCATAJOSed12SPATAJOSed13SPATAJOSed14SPATAJOSed15SPATAJOSed16SPATAJOSed17SPATAJOSed18SPATAJOSed19SPATAJOSed10SPATAJOSed11SPATAJOSed12SPATAJOSed13SPATAJOSed14SPATAJOSed15SPATAJOSed16SPATAJOSed17SPATAJOSed18SPATAJOSed19SPATAJOSed19SPATAJOSed10SPATAJOSed11SPATAJOSed13SPATAJOSed14SPATAJOSed <t< th=""><th>No.</th><th>Pin Name</th><th>I/O</th><th>Descriptions</th></t<>	No.	Pin Name	I/O	Descriptions
3GNDGNDGround4BUE_LEDJ/OGPIO5RED_LEDJ/OGPIO6NCJ/OTest Point7NCJ/OTest Point8IZS_DATAJ/OData pin of IZS signal9GNDGNDGROU10IZC_CLKJ/OClock pin of IZC control signal11IZC_DATAJ/OData pin of IZC control signal12SPLDIJ/OData upt pin of SPI interface13SPLOJ/OClock pin of SPI interface14SPLCKJ/OClock pin of SPI interface15SPLCSJ/OClock pin of SPI interface16SPLWPJ/OClock pin of SPI interface17IDO_RESETJ/OGPIO18SPLSEJ/OGPIO19PCTLJ/OGPIO10MR-STONJ/OGPIO11MP-PDNJ/OGPIO12MP-SDJ/OGPIO13SPLSEJ/OGPIO14SPLSENJ/OGPIO15MP-SDNJ/OGPIO16MP-SDNJ/OGPIO17SPLSENJ/OGPIO18MP-SDNJ/OGPIO19MP-SDNJ/OGPIO10GPIOGPIO11SPLSENJ/OGPIO12MP-SDNJ/OGPIO13GPIAJ/OGPIO14 <t< th=""><th>1</th><th>VCCIO</th><th>PWR</th><th>VCC supply</th></t<>	1	VCCIO	PWR	VCC supply
4BUE LEDI/OGPIO5RED LEDI/OGPIO6NCI/OTest Point7NCI/OData pin of I2S signal8ISDATAI/OGound9GNDGNDGOU10I2C CLKI/OClock pin of I2C control signal11I2C DATAI/OData pin of I2C control signal12SPLDII/OData pin of I2C control signal13SPLDQI/OData pin of SPI interface14SPLOKI/OClock pin of SPI interface15SPLOKI/OClock pin of SPI interface16SPLWPI/OClock pin of SPI interface17DO RESETI/OClock pin of SPI interface18SPLNEI/OGPIO19PCTLI/OGPIO10PCTLI/OGPIO11MP.PDNI/OGPIO12MP.SDAI/OGPIO13SPLSEI/OGPIO14SPLSEI/OGPIO15MP.SDAI/OGPIO16MP.SDAI/OGPIO17SPLSEI/OGPIO18MP.SDAI/OGPIO19SPLSEI/OGPIO10GPIOGPIO11SPLSEI/OGPIO12MP.SDAI/OGPIO13GPLSEI/OGPIO14SPLSEI/OGPIO <td< th=""><th>2</th><th>GND</th><th>GND</th><th>Ground</th></td<>	2	GND	GND	Ground
NoNoGPIO6NCI/OGPIO6NCI/OTest Point7NCI/OData pin of I2S signal8I2S_DATAI/OData pin of I2S signal9NDGNDGND10I2C_CLKI/OClock pin of I2C control signal11I2C_DATAI/OData pin of I2C control signal12SPLDII/OData input pin of SPI interface13SPLDOI/OData out pin of SPI interface14SPLCKI/OClock pin of SPI interface15SPLCSI/OClock pin of SPI interface16SPLSEI/OClock pin of SPI interface17IDO,RESETI/ORest pin of SPI interface, low active18P.SENSEI/OGPIO19P.CTLI/OGPIO10RESTI/OGPIO11MP.PDNI/OGPIO12MP.SDI/OGPIO13SPLSEI/OGPIO14SPLSEI/OGPIO15SPLSEI/OGPIO16SPLSEI/OGPIO17MP.SDI/OGPIO18SPLSEI/OGPIO19SPLSEI/OGPIO10SPLSEI/OGPIO11SPLSEI/OGPIO12SPLSEI/OGPIO13SPLSEI/OGPIO14SPLSEI/O	3	GND	GND	Ground
6NCI/OTest Point7NCI/OTest Point8IS_DATAI/OData pin of I2S signal9GNDGNDGND10IZ_CLKI/OClock pin of I2C control signal11IZ_DATAI/OData pin of I2C control signal12SPLDII/OData pin of I2C control signal13SPLDOI/OData out pin of SPI interface14SPLCKI/OClock pin of SPI interface15SPLCSI/OClock pin of SPI interface16SPLCSI/OClock pin of SPI interface17LDO_RESETI/OClock pin of SPI interface, low active18P.SENSEI/OGPIO19P.CTLI/OGPIO10RESTI/OGPIO11MP.PDNI/OGPIO12MP.SDI/OGPIO13SPLSEI/OGPIO14SPLSEI/OGPIO15GNDGPIO16MP.SDI/O17SPLOSI/O18SPLOSI/O19SPLONI/O19SPLONI/O19SPLONI/O19SPLONI/O19SPLONI/O19SPLONI/O19SPLONI/O19SPLONI/O10GPLON11SPLONI/O12SPLONI/O	4	BLUE_LED	I/O	GPIO
NCI/OTest Point8IS_DATAI/OData pin of I2S signal9GNDGNDGND10I2C_CLKI/OClock pin of I2C control signal11I2C_DATAI/OData pin of I2C control signal12SPLDII/OData pin of SPI interface13SPLDOI/OData out pin of SPI interface14SPLCKI/OClock pin of SPI interface15SPLCSI/OClock pin of SPI interface16SPLCSI/OClock pin of SPI interface, low active17IDO,RESETI/OWrite protect pin of SPI interface, low active18P_SENSEI/OGPIO19P_CTLI/OGPIO10MP_PDNI/OGPIO12AMP_SDI/OGPIO13SPLSERI/OGPIO14SP_SENSEI/OGPIO15GNDGPIO16MP_SDI/O17GPIO18SPLSENSI/O19GPIO10GPIO11GPIO12MP_SDI/O13GND14SPLSENS15GPIO16GPIO17GPIO18GPIO19GPIO19GPIO19GPIO19GPIO19GPIO10GPIO10GPIO11GPIO12<	5	RED_LED	I/O	GPIO
8I2S_DATAI/OData pin of I2S signal9NDGNDGNDGround10I2C_CLKI/OClock pin of I2C control signal11I2C_DATAI/OData pin of I2C control signal12SPLDII/OData pin of SPI interface13SPLDOI/OData out pin of SPI interface14SPLCKI/OClock pin of SPI interface15SPLCSI/OClock pin of SPI interface16SPLWPI/OClock pin of SPI interface, low active17LDO_RESETI/OKrite protect pin of SPI interface, low active18P_SENSEI/OGPIO19P_CTLI/OGPIO10MP_PDNI/OGPIO12AMP_SDI/OGPIO13Wireless_ReadyI/OGPIO14SP_SEKI/OGPIO15GNDI/OGPIO	6	NC	I/O	Test Point
9GNDGNDGNDGround10I2C,CLKI/OClock pin of I2C control signal11I2C,DATAI/OData pin of I2C control signal12SPL,DII/OData input pin of SPI interface13SPL,DOI/OData out pin of SPI interface14SPL,CLKI/OClock pin of SPI interface15SPL,CLKI/OClock pin of SPI interface16SPL,CLKI/OClock pin of SPI interface, low active17LDO,RESETI/OWrite protect pin of SPI interface, low active18P,SENSEI/OGPIO19P,CTLI/OGPIO20PWM,RSTI/OGPIO21AMP_SDI/OGPIO22MMP,SDI/OGPIO23Wireless_ReadyI/OGPIO24I2S,BCKI/OGPIO25GNDGNDGND	7	NC	I/O	Test Point
10I2C_CLKI/OClock pin of I2C control signal11I2C_DATAI/OData pin of I2C control signal12SPL_DII/OData input pin of SPI interface13SPL_DOI/OData out pin of SPI interface14SPL_CLKI/OClock pin of SPI interface15SPL_CSI/OClock pin of SPI interface16SPL_WPI/OClock pin of SPI interface, low active17LDO_RESETI/OWrite protect pin of SPI interface, low active18P_SENSEI/OGPIO19P_CTLI/OGPIO20NVM_RSTI/OGPIO21AMP_PDNI/OGPIO22AMP_SDI/OGPIO23Wireless_ReadyI/OGPIO24I2S_BCKI/OGND25GNDGNDGND	8	I2S_DATA	I/O	Data pin of I2S signal
11I2C_DATAI/OData pin of I2C control signal12SPL_DII/OData input pin of SPI interface13SPL_DOI/OData out pin of SPI interface14SPL_CLKI/OClock pin of SPI interface15SPL_CSI/OChip select pin of SPI interface, low active16SPL_WPI/OWrite protect pin of SPI interface, low active17LDO_RESETIReset pin of IA3, low active18P_SENSEI/OGPIO19P_CTLI/OGPIO20NWM_RSTI/OGPIO21AMP_PDNI/OGPIO22AMP_SDI/OGPIO23Wireless_ReadyI/OGPIO24I2S_BCKI/OGPIO25GNDGNDGND	9	GND	GND	Ground
12SPL DII/OData input pin of SPI interface13SPL DOI/OData out pin of SPI interface14SPL CLKI/OClock pin of SPI interface15SPL CSI/OClock pin of SPI interface16SPL WPI/OWrite protect pin of SPI interface, low active17LOO RESETIReset pin of IA3, low active18P.SENSEI/OGPIO19P.CTLI/OGPIO20PWM_RSTI/OGPIO21AMP_PDNI/OGPIO22AMP_SDI/OGPIO23Wireless_ReadyI/OGPIO24I2S_BCKI/OGPIO25GNDGNDGND	10	I2C_CLK	I/O	Clock pin of I2C control signal
13SPLDOI/OData out pin of SPI interface14SPLCLKI/OClock pin of SPI interface15SPLCSI/OChip select pin of SPI interface, low active16SPLWPI/OWrite protect pin of SPI interface, low active17LDO_RESETIReset pin of IA3, low active18P_SENSEI/OGPIO19P_CTLI/OGPIO20PWM_RSTI/OGPIO21AMP_PDNI/OGPIO22AMP_SDI/OGPIO23Wireless_ReadyI/OGPIO24IS_BCKI/OSCK pin of I2S signal25GNDGNDGND	11	I2C_DATA	I/O	Data pin of I2C control signal
14SPI_CLKI/OClock pin of SPI interface15SPI_CSI/OChip select pin of SPI interface16SPI_WPI/OWrite protect pin of SPI interface, low active17LDO_RESETIReset pin of IA3, low active18P_SENSEI/OGPIO19P_CTLI/OGPIO20PWM_RSTI/OGPIO21AMP_PDNI/OGPIO22AMP_SDI/OGPIO23Wireless_ReadyI/OGPIO24IS_BCKI/OBCK pin of I2S signal25GNDGNDGND	12	SPI_DI	I/O	Data input pin of SPI interface
10101015SPLCSI/OChip select pin of SPI interface16SPLWPI/OWrite protect pin of SPI interface, low active17LDO_RESETIReset pin of IA3, low active18P_SENSEI/OGPIO19P_CTLI/OGPIO20PWM_RSTI/OGPIO21AMP_PDNI/OGPIO22AMP_SDI/OGPIO23Wrieless_ReadyI/OGPIO24I2S_BCKI/OGPIO25GNDGNDGND	13	SPI_DO	I/O	Data out pin of SPI interface
16SPL_WPI/OWrite protect pin of SPI interface, low active17LDO_RESETIReset pin of IA3, low active18P_SENSEI/OGPIO19P_CTLI/OGPIO20PWM_RSTI/OGPIO21AMP_PDNI/OGPIO22AMP_SDI/OGPIO23Wireless_ReadyI/OGPIO24I2S_BCKI/OBCK pin of I2S signal25GNDGNDGND	14	SPI_CLK	I/O	Clock pin of SPI interface
17LDO_RESETIReset pin of IA3, low active18P_SENSEI/OGPIO19P_CTLI/OGPIO20PWM_RSTI/OGPIO21AMP_PDNI/OGPIO22AMP_SDI/OGPIO23Wireless_ReadyI/OGPIO24I2S_BCKI/OGPIO25GNDGNDGND	15	SPI_CS	I/O	Chip select pin of SPI interface
18P_SENSEI/OGPIO19P_CTLI/OGPIO20PWM_RSTI/OGPIO21AMP_PDNI/OGPIO22AMP_SDI/OGPIO23Wireless_ReadyI/OGPIO24I2S_BCKI/OBCK pin of I2S signal25GNDGNDGND	16	SPI_WP	I/O	Write protect pin of SPI interface, low active
19P_CTLI/OGPIO20PWM_RSTI/OGPIO21AMP_PDNI/OGPIO22AMP_SDI/OGPIO23Wireless_ReadyI/OGPIO24IS_BCKI/OSCK pin of I2S signal25GNDGNDGND	17	LDO_RESET	I	Reset pin of IA3, low active
20PWM_RSTI/OGPIO21AMP_PDNI/OGPIO22AMP_SDI/OGPIO23Wireless_ReadyI/OGPIO24I2S_BCKI/OBCK pin of I2S signal25GNDGNDGND	18	P_SENSE	I/O	GPIO
21AMP_PDNI/OGPIO22AMP_SDI/OGPIO23Wireless_ReadyI/OGPIO24I2S_BCKI/OBCK pin of I2S signal25GNDGNDGND	19	P_CTL	I/O	GPIO
22AMP_SDI/OGPIO23Wireless_ReadyI/OGPIO24I2S_BCKI/OBCK pin of I2S signal25GNDGNDGND	20	PWM_RST	I/O	GPIO
23Wireless_ReadyI/OGPIO24I2S_BCKI/OBCK pin of I2S signal25GNDGNDGND	21	AMP_PDN	I/O	GPIO
24 I2S_BCK I/O BCK pin of I2S signal   25 GND GND Ground	22	AMP_SD	I/O	GPIO
25 GND GROUND Ground	23	Wireless_Ready	I/O	GPIO
	24	I2S_BCK	I/O	BCK pin of I2S signal
26 I2S_LRCK I/O LRCK pin of I2S	25	GND	GND	Ground
	26	I2S_LRCK	I/O	LRCK pin of I2S

# Appendix A: Specifications

Normal			
Interface	FPC connector		
Radio Data Rate	2Mbps		
Modulation	GFSK		
Frequency	2.400 ~ 2.4835GHz		
Operating Voltage	3.0Vdc to 3.6Vdc, Normal is 3.3Vdc		
Safety & Emissions	FCC/ IC, CE		

Environmental and Physical			
Operating Temp.	0 ~55		
Humidity	10% ~ 90% RH, Non-condensing		
Product Dimensions	35.0* 35.0 mm		