

Moxa 802.11a/n/ac

WAPC002 User's Manual

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MOXA®

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WAPC002 User's Manual

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Introduction

The following topics are covered in this chapter:

- Overview**
- Specifications**

Overview

WAPC002 PCIe module is designed to provide wireless communication for Moxa industrial wireless products. It communicates via the standard 802.11a/n/ac protocols on standard 5GHz and 5GHz DFS channels. The WAPC002 uses the QCA99X4 SoC Wireless chipset from Qualcomm.

Specification

Features	WAPC002
Chipset	Qualcomm QCA99X4
Baseband Processor (BBP)	<ul style="list-style-type: none"> - DSSS with DBPSK, DQPSK, CCK - OFDM with BPSK, QPSK, 16QAM, 64QAM - 802.11a : 64QAM @ 54/48 Mbps, 16QAM @ 36/24 Mbps, QPSK @ 18/12 Mbps, BPSK @ 9/6 Mbps - 802.11n: 64QAM @ 600 Mbps to BPSK @ 6.5 Mbps - 802.11ac: 256QAM @ 1,733 Mbps to BPSK @ 29.3 Mbps
security engine	- 64-bit and 128-bit WEP encryption, WPA /WPA2-Personal and Enterprise (IEEE 802.1X/RADIUS, TKIP and AES)
Connectors	PCI Express Mini Card
Power requirement	3.3V +/-10%
Dimension	60mm x 60mm x 1.2mm
Operating Temperature	-40 to 50°C
Storage Temperature:	-40 to 85°C
Operates in 5 GHz frequency bands.	US: 5.180 to 5.240 (4 channels) 5.260 to 5.320 (4 channels) 5.500 to 5.700 GHz (11 channels) 5.745 to 5.825 GHz (5 channels) EU: 5.180 to 5.240 (4 channels) 5.260 to 5.320 (4 channels) 5.500 to 5.700 GHz (11 channels) JP: 5.180 to 5.240 (4 channels) 5.260 to 5.320 (4 channels) 5.500 to 5.700 GHz (11 channels)

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Getting Started

This chapter covers the module layout, and block diagram, hardware installation of the WAPC002. Software installation is covered in the next chapter.

The following topics are covered:

- Module Layout**
- Block Diagram**
- Hardware Installation**
- Software Installation**

mPCIe Bus Connector PIN Assignments

Function	Connect to	Pin	Pin	Function	Connect to
WAKE_L	WAKE_L	1	2	3.3V	DVDD33
RESERVED	NC	3	4	GND	GND
RESERVED	NC	5	6	1.5V	NC
CLKREQ_L	NC	7	8	UIM_PWR	NC
GND	GND	9	10	UIM_DATA	NC
REFCLK-	REFCLK-	11	12	UIM_CLK	NC
REFCLK+	REFCLK+	13	14	UIM_RESET	NC
GND	GND	15	16	UIM_VPP	NC
UIM_C8	NC	17	18	GND	GND
UIM_C9	NC	19	20	W_DISABLE_L	GPIO18
GND	GND	21	22	RESET_L	RESET_L
PERn0	PERn0	23	24	3.3VAUX	DVDD33
PERp0	PERp0	25	26	GND	GND
GND	GND	27	28	1.5V	NC
GND	GND	29	30	SMB_CLK	NC
PETn0	PETn0	31	32	SMB_DATA	NC
PETp0	PETp0	33	34	GND	GND
GND	GND	35	36	USB_D-	NC
RESERVED	NC	37	38	USB_D+	NC
RESERVED	NC	39	40	GND	GND
RESERVED	NC	41	42	LED_WWAN_L	NC
RESERVED	GND	43	44	LED_WLAN_L	GPIO17
RESERVED	DVDD33	45	46	LED_WPAN_L	NC
RESERVED	DVDD33	47	48	1.5V	NC
RESERVED	DVDD33	49	50	GND	GND
RESERVED	DVDD33	51	52	3.3V	DVDD33

Hardware Installation

The WAPC002 can be installed into all Moxa wireless system board series.

Required Professional Installation Step

1. Install the WAPC002 PCIE card on the system board. Apply pressure to both bus connectors and gently press the board onto the stack. The board should slide into the matching bus connectors. Do not attempt to force the board, as this can lead to bent/broken pins.
2. Screw on the WAPC002 PCIE card.
3. Screw on the all the necessary chassis.

Software Installation

After physically installing the WAPC002, your operating system must be configured to recognize the new system board.

Step for Installation

1. Apply power to the system board.
2. Connect system board and PC with Ethernet cable.
3. Open a browser and type: 192.168.127.253 to open the system login webpage.
4. Login the webpage with default password: root in order to verify that all of the hardware is install properly.

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:

To assure continued compliance, (example - use only shielded interface cables when connecting to computer or peripheral devices) 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:

This module is restricted to mobile configuration. 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 60 cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter. This transmitter module must not be co-located or operating in conjunction with any other antenna or transmitter

CAUTION:

Any changes or modifications not expressly approved by the grantee of this device could void the user's authority to operate the equipment.

End Product Labeling

This transmitter module is authorized only for use in device where the antenna may be installed such that 60cm 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: SLE-WAPC002 "

Canada, Industry Canada (IC) Notices

This device complies with Industry Canada's 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.

Canada, avis d'Industry Canada (IC)

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.

Users should also be advised that high-power radars are allocated as primary users (i.e. priority users) of the bands 5250-5350 MHz and 5650-5850 MHz and that these radars could cause interference and/or damage to LE-LAN devices.

Devraient également être informés les utilisateurs que les radars à haute puissance sont désignés comme utilisateurs principaux (c.-à-utilisateurs prioritaires) des bandes 5250-5350 MHz et 5650-5850 MHz et que ces radars pourraient provoquer des interférences et / ou endommager les appareils LE-LAN.

Radio Frequency (RF) Exposure Information

The radiated output power of the Wireless Device is below the Industry Canada (IC) radio frequency exposure limits. The Wireless Device should be used in such a manner such that the potential for human contact during normal operation is minimized.

This device has also been evaluated and shown compliant with the IC RF Exposure limits under mobile exposure conditions. (antennas are greater than 60cm from a person's body).

Informations concernant l'exposition aux fréquences radio (RF)

La puissance de sortie émise par l'appareil de sans fil est inférieure à la limite d'exposition aux fréquences radio d'Industry Canada (IC). Utilisez l'appareil de sans fil de façon à minimiser les contacts humains lors du fonctionnement normal.

Ce périphérique a également été évalué et démontré conforme aux limites d'exposition aux RF d'IC dans des conditions d'exposition à des appareils mobiles (antennes sont supérieures à 60 cm à partir du corps d'une personne).

End Product Labeling

This transmitter module is authorized only for use in device where the antenna may be installed such that 60cm may be maintained between the antenna and users. The final end product must be labeled in a visible area with the following: "Contains IC: 9335A-WAPC002 "

Information for the OEMs and Integrators

The following statement must be included with all versions of this document supplied to an OEM or integrator, but should not be distributed to the end user.

- 1) This device is intended for OEM integrators only.
- 2) Please see the full Grant of Equipment document for other restrictions.

Information for the OEMs and Integrators

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- 1) This device is intended for OEM integrators only.
- 2) Please see the full Grant of Equipment document for other restrictions.

This radio transmitter FCCID: SLE-WAPC002 and IC: 9335A-WAPC002 has been approved by FCC/IC to operate with the antenna types listed below with the maximum permissible gain and required antenna impedance for each antenna type 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.

Antenna List

No.	Manufacturer	Part No.	Antenna Type	Peak Gain
1	MOXA	MAT-WDB-PA-NF-2-0708	Panel	8.77dBi for 5.15~5.25GHz 8.77dBi for 5.25~5.35GHz 8.50dBi for 5.47~5.725GHz 8.18dBi for 5.725~5.825GHz
2	MOXA	MI05-A1-XX23037-X0	Panel	23dBi for 5GHz
3	MOXA	MI05-A1-XX16020-X0	Panel	12dBi for 5GHz
4	MOXA	WI25-A1-0810012-RG316	Panel	10.5dBi for 5GHz
5	MOXA	ANT-WSB5-PNF-18	Panel	18dBi for 5GHz
6	MOXA	ANT-WDB-PNF-1518	Panel	18dBi for 5GHz
7	MOXA	ANT-WDB-ARM-02	Dipole	0.81dBi for 5GHz
8	MOXA	ANT-WSB-ANF-12	Dipole	12dBi for 5GHz
9	MOXA	MAT-WDB-CA-RM-2-0205	Dipole	5.0dBi for 5.15~5.25GHz 5.7dBi for 5.25~5.35GHz 4.9dBi for 5.47~5.725GHz 5.2dBi for 5.725~5.825GHz
10	MOXA	MAT-WDB-DA-RM-2-0203-1m	Dipole	3.80dBi for 5.15~5.25GHz 2.72dBi for 5.25~5.35GHz 2.26dBi for 5.47~5.725GHz 2.34dBi for 5.725~5.825GHz
11	MOXA	ANT-WDB-ANM-0306	Dipole	5.7dBi for 5.15~5.25GHz 5.7dBi for 5.25~5.35GHz 6.3dBi for 5.47~5.725GHz 6.3dBi for 5.725~5.825GHz
12	MOXA	ANT-WDB-ARM-0202	Dipole	1.8dBi for 5GHz
13	MOXA	ANT-WDB-ANM-0502	Dipole	2.0dBi for 5GHz
14	MOXA	ANT-WDB-ANM-0407	Dipole	7.0dBi for 5GHz
15	MOXA	ANT-WDB-ANF-0609	Dipole	9.0dBi for 5GHz
16	MOXA	ANT-WDB-ANM-0609	Dipole	9.0dBi for 5GHz
17	MOXA	MHH-A11-XX110170-X0	Railway	8.0dBi for 5GHz
18	MOXA	WI25-A1-1215053-X0	Sector	15dBi for 5GHz
19	MOXA	TOP 200 AMR MF-05-4	Patch	8.5dBi for 5GHz

NCC 警語:

經型式認證合格之低功率射頻電機，非經許可，公司、商號或使用者均不得擅自變更頻率、加大功率或變更原設計之特性及功能。

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前項合法通信，指依電信法規定作業之無線電通信。低功率射頻電機須忍受合法通信或工業、科學及醫療用電波輻射性電機設備之干擾。

本模組於取得認證後將依規定於模組本體標示審驗合格標籤，並要求最終產品平台廠商(OEM Integrator)於最終產品平台(End Product)上標示”本產品內含射頻模組，其 NCC 型式認證號碼為：

CCXXxxYYyyyZzW