



408 Churchill Ave N  
Ottawa, ON, K1Z 5C6  
Tel: (613) 271-3710

---

# **EWC24GWFR1 Radio Module User Manual**

Revision 04

2017-10-20

This document is proprietary and confidential to Edgewater Wireless Systems, Inc.  
No information from this document may be reproduced or disclosed without express written permission.

Copyright © 2017 Edgewater Wireless Systems, Inc

## Table of Contents

1	Introduction.....	2
2	Antenna.....	2
3	RF Guidelines.....	4
3.1	Compliance .....	4
4	Thermal Considerations.....	5

## Tables

Table 1	EWSI radio card Thermal Specifications.....	5
---------	---	---

## Figures

Figure 1	EWC24GWFR1 Top Side.....	2
Figure 2	EWC24GWFR1 Bottom Side .....	3
Figure 3	EWC24GWFR1 Top Side No Shield.....	6
Figure 4	EWC24GWFR1 RF Shield .....	7

## 1 Introduction

The EWC24GWFR1 mini-PCI card is multi-channel WiFi card. It simultaneously supports 3 independent IEEE 802.11b/g compatible radio channels.

The EWC24GWFR1 enables the OEM to build high capacity WiFi Access Points for unique high performance applications.

### Module Summary

- Compliant with IEEE 802.11b/g
- FCC and IC certification
- Operating frequency range 2412-2462 MHz, locked by radio firmware

## 2 Antenna

Figure 1 EWC24GWFR1 Top Side

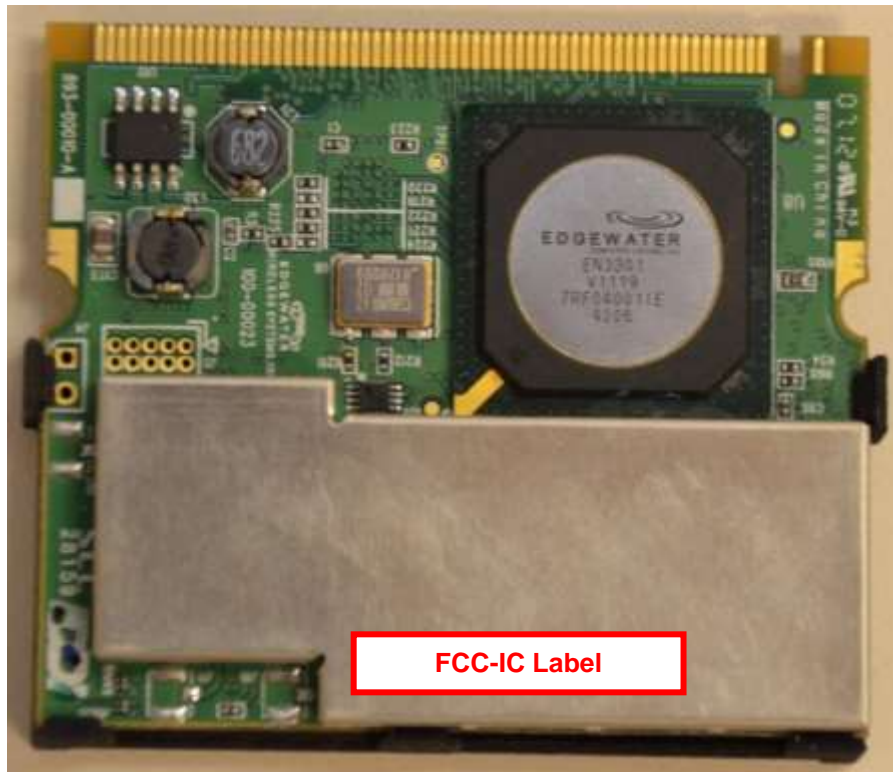


Figure 2 EWC24GWFR1 Bottom Side



UFL Port Tx Antenna

UFL Port Rx Antenna

UFL Port Rx -Diversity Antenna

**Not Used**

### 3 RF Guidelines

The EWC24GWFR1 card is certified to FCC and Industry Canada specifications for use in unlicensed band applications operating at 2.412 to 2.462 GHz.

License ID:

FCC ID: ATX-EWC24GWFR1

IC: 10165A-EWC24GWFR1

To ensure compliance to the regulations for unlicensed band radio spectrum the system integrator must observe the following guidelines:

- User accessible Antenna ports shall be unique connectors for purpose selected antenna
- The maximum EIRP of the final system product with external antenna shall be limited to 30dBm
- A system incorporating this module shall be designed by an RF Engineer such that a professional installer can ensure that the combination of the selected antenna and maximum Transmit power level shall not exceed maximum EIRP of 19.25dBi. (16.25dBm-card output power + 3dBi antenna gain)
- The host communication interface to the radio module is proprietary and unique to Edgewater Wireless (i.e. not open source). Specifically, the multi-channel interface API (Application Program Interface) is of a unique architecture requiring specific knowledge of the configuration parameters and data path algorithms to make it operational. Approved system Integrators must contact Edgewater Wireless and apply for access to the required application notes that are limited to approved integrators and is covered by non-disclosure agreements.
- Maximum conducted Output Power
  - 3 Channels 16.25dBm, +/- 0.5dBm
  - 2 Channel 16.25 +/-0.5 dBm total; 13.25dBm +/- 0.5dBm per carrier
  - 1 Channel 16.25 +/-0.5 dBm total; 11.55dBm +/- 0.5dBm per carrier

#### 3.1 Compliance

Regulatory

- This radio transmitter, *10165A-EWC24GWFR1*, 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.
- 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.
- This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules and with Industry Canada licence-exempt RSS standard(s) . These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment.
- This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense. Any modifications by the user of the product may void the user's authority to operate the product.

Antenna

- Maximum Antenna Gain 3dBi

- Separate TX & RX antenna port via on-card non-standard RP-U.FL (UMCC) PCB connectors
- Authorized Antenna for Laird Part# RD2458-5-RSMA (reverse polarity SMA male connector) or equivalent antenna
- “The antenna(s) used for this transmitter 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.”

## Product Labels

- “The outside of the device into which the module is installed must display a label with Contains FCC ID: ATX-EWC24GWFR1, Contains IC: 10165A-EWC24GWFR1”

## 4 Thermal Considerations

The radio dissipates a maximum of 7.6watts. Consideration must be given to thermal management such that sensitive components on the card do not exceed their maximum operation temperature. It is recommended that the integrator use an aluminum heat sink adjacent to the RF shield.

The following table provides thermal info and constraints that the integrator must consider in designing the thermal management scheme.

Component	Height (mm)	Power (W)	Package (WxLxH mm)	Material	R <sub>ja</sub> (°C/W)	R <sub>jc</sub> (°C/W)	R <sub>jb</sub> (°C/W)	T <sub>max</sub> (°C)
EN3301	2.0 ±.13	2.5	23x23x2.0 BGA w/ spread	Plastic, Cu spread	15	1.8	7.3	118
Oscillator	2	0.23	7x5x2	Ceramic	33	8		110
PA	1.56	0.99	3x3x1 MSOP	Plastic w/ pad	25	8		150
EN3201	0.9 ±.1	1.25	7x7x 0.9 MLP	Plastic w/ slug	25	9.5	4	110
EN3101	1.6	2.65	12x12x2.4 FCBGA with cap	Cu cap	20	2	5	105

**Table 1 EWSI radio card Thermal Specifications**

Figure 3 EWC24GWFR1 Top Side No Shield



Figure 4 EWC24GWFR1 RF Shield



This RF section covered

Note:  
Thermal conductive material to be placed between the lid and the external heatsink