ENGINEERING TECHNICAL NOTE

Project Number 13009
Project Name Omitec Wi-Fi module

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Author	Steve Rivers				
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Omitec Group Ltd
Hopton Estate, London Road, Devizes, Wiltshire. SN10 2EU. England
Telephone: +44 (0)1380 732000 Fax: +44 (0)1380 732001
Registered Number 998111

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INTRODUCTION

REFERENCES TO OTHER DOCUMENTATION

The following documents are relevant to specification for the reasons shown.

Reference	Document Title	Date/Issue	Usage
[1]	*Public Note DA 00-1407*	*June, 26, 2000*	
[2]	*CFR Title 47*		
[3]	*Public Notice DA00-2225*	*September 28, 2000*	*Antenna Connection Requirements*

OVERVIEW

The Omitec Wi-Fi module was conceived to allow Omitec's existing and future products to be converted from fixed wired systems into mobile, flexible wireless solutions for vehicle service and diagnostics. Utilising the worldwide wireless network protocol IEEE 802.11b allows for ease of use.

Limited Modular Approval is requested to facilitate integration with current and future Omitec systems and reduce the need for repeated testing. In accordance with Public Notice DA 00-1407, the following issues are addressed.

1. RF Shielding
2. Data Inputs
3. Power Supply regulation
4. Antenna
5. Labelling
6. Specific operating requirements
7. RF exposure requirements

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1. RF SHIELDING

The RF core of the Omitec Wi-Fi module is the Lantronix Wi-Port embedded device server, Lantronix part WP2001000-01. The module is a sealed, shielded transceiver with a co-axial cable to antenna socket.

2. DATA INPUTS

The module takes serial RS232 data as its input; therefore it is not possible to cause over-modulation. An excessive data rate will prevent the unit decoding the data correctly and no information will be transmitted.

3. POWER SUPPLY REGULATION

The module accepts unregulated dc power in the range of 8V to 18V and outputs a regulated 3.3V to the rest of the module. This ensures that the RF components have a guaranteed supply.

4. ANTENNA

The Wi-Fi module will only be supplied with a WSS015 antenna, from Wanshih Electronic Company, with a maximum peak gain of 2dBi @ 2.4 ~ 2.5GHz. The antenna connects to the module via a RP-SMA connector. This meets the requirements of Section 15.203 with reference to FCC Public Note DA 00-2225.

The antenna will be mounted either internally or externally, depending on the product.

The user manual will also contain a warning to the user as follows.
“Any change or modification to the product not expressly approved by Omitec could void the user's authority to operate the device.”

5. LABELLING

The Wi-Fi module will be identified with FCC ID: SV4-OMWF01 as a part of the PCB text, as shown in figure 1.

Since the module will not be visible in the final product, each product will have the following text incorporated into there respective labels.
“Contains Transmitter Module FCC ID: SV4-OMWF01”

6. SPECIFIC OPERATING REQUIREMENTS

There are no operating requirements for section 15.247 that can be modified by the user.

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7. RF EXPOSURE REQUIREMENTS

7.1 EXPOSURE LIMITS

The RF exposure limits for radio transmitters are defined in 47 CFR part1.1310. For the Omitec Wi-Fi Module, the applicable power density limit is given in table 1A Limits for Occupational/Controlled Exposure (5mW/cm^2)

7.2 DEVICE PARAMETERS

Maximum conducted output power	= +15 dBm	(1)
Antenna gain	= +2dBi	(2)
Therefore		
Maximum EIRP	= +17dBm	(3)
	= 50.12mW	

7.3 POWER DENSITY CALCULATION

Using equation 4 from FCC OET Bulletin 65

$$S = \frac{EIRP}{4\partial R^2}$$

Where:

EIRP = 50.12mW (from 3 above)
R = 20cm

Gives

Power Density = 0.01mW/cm^2

7.4 CONCLUSION

The Omitec Wi-Fi module will be used within automotive diagnostic and repair environment. The separation of 20cm or more from the user will be ensured by the nature of the application; therefore the Omitec Wi-Fi module does meet the requirements for a mobile device.

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Document History

Issue	Date	Author	Change
1	24 Jan, 2005	S. Rivers	New Document
2	1 April, 2005	S. Rivers	Clarification of section 4, Antenna