

# **Operational Description**

**For**

**WLAN a+b+g Mini-PCI Module**

**Model:**

**EM-500AG**

The WLAN 802.11a+b+g Mini-PCI Module is embedded 2.4GHz & 5GHz Wireless Local Area Network Mini-PCI adapter. The channel and the center frequency are located on the free licensed ISM band from 2412MHz to 2462MHz (11b/11g), 5180MHz to 5805MHz (11a), and different Modulations are applied to different select data rate mechanism. For being in 802.11b mechanism, the DBPSK modulation operates at 1Mbps low data transmit rate, the DQPSK modulation operates at 2Mbps standard data transmit rate, the CCK operates at 5.5 medium and 11Mbps high data transmit rate respectively. For being in 802.11g mechanism, the BPSK-OFDM modulation operates at 6Mbps/9Mbps data transmit rate, the QPSK-OFDM modulation operates at 12Mbps/18Mbps data transmit rate, the 16QAM-OFDM operates at 24Mbps/36Mbps data transmit rate, the 64QAM-OFDM operates at 48Mbps/54Mbps data transmit rate respectively. For being in 802.11a normal mode mechanism, the modulation is same as 802.11g, and for being in 802.11a turbo mode mechanism, the modulation operates at double data rate of normal mode.

There are 11 operation channels in 802.11b & 802.11g, 12 operation channels in 802.11a normal mode, and 5 operation channels in 802.11a turbo mode.

The adapter is 60mm x 45mm in dimension, and mainly contains a 196-pin MAC controller and a fully duplex RF transceiver module inside. The transceiver module contains a 49-pin 802.11a modulator, a 54-pin 802.11b/g modulator, and two 12-pin Power Amplifiers. The LO frequency of the fully duplex RF transceiver is 3168MHz for 802.11b/g, and 0.8 X channel frequency for 802.11a. The RF transceiver is connected to a set of antennas via its transmit and receive Hirose connectors. For reducing the fading effect, the antenna diversity is applied. The distance between the main antenna and the aux antenna should be kept a half of the wave length.

The Mini-PCI form factor is designed for notebook computer systems where overall thickness must be kept to an absolute minimum. When the PCI interface connects the WLAN adapter and notebook PC for baseband data communicating, the adapter could be bound inside the notebook PC, and a high frequency coaxial cable along the casing links the adapter and the antenna from the notebook bottom to the top seam of the LCD plane. The distance among the antenna, the adapter, and the human body would be large enough for anti-interference and anti-exposure in normal operation.