

Product code WAF2400-1000L
Antenna Amplifier, 2.4-2.4835 GHz, 0.250 W Output

Caution: For use only with the provided Lucent Technologies **ORiNOCO** Model: PC24E-00-FC WaveLAN 2.4 GHz wireless card with FCC ID: IMRWLPC24. Use of other radio transmitters with this amplifier may cause interference, and is a violation of FCC Rules.

The bi-directional RF amplifier greatly increases usable signal transmission range by increasing receiver sensitivity and compensating for various line losses (in the feeder, connectors and cable) and signal losses due to electromagnetic radiation.

Receiver Performance

Maximum Gain: 22dB

Noise Figure: 2.8 dB

Frequency Response: +/- 0.5 dB over operating range

Output Saturation RF Power: 10 mW

Transmitter Performance

Automatic Gain Control

Maximum Gain: 30 dB

Input RF Power: 0.5 - 100 mW

Maximum Output RF Power: 250 mW

Input/Output Impedance: 50 Ohm

Switching Power: 0.2 - 0.4 mW

Switch Delay Time: 0.5 - 0.8 mks

Input/Output Connectors: N – Type Female

Operating Temperature: -50°C - +50°C

Power Supply Specifications

Input Voltage: 110 - 240 VAC 50/60 Hz

Output Voltage/Power: 12 VDC / 10 W

DC Power Injector :

- Radio Modem Connector: N – Type Female

- Amplifier Connector: N – Type Female

- 12 VDC Power Input Connector: BNC - Type Female



Filter Specifications

Filter Bandwidth: 100 MHz

RF Range: 2.4 - 2.5 GHz

Insertion Loss in 2.4-2.5 GHz: 0.5 dB

Signal Attenuation: 50 dB @ 2 GHz

Signal Attenuation: 50 dB @ 3 GHz

Physical Characteristics

Amplifier Weight: 2.0 lbs (0.9 kg)

Amplifier Dimensions: 12 in x 4.8 in x 2.8 in (300mm x 120mm x 70mm)

Power Supply Weight: 1.0 lb (0.45 kg)

Power Supply Dimensions: 12 in x 4.8 in x 2.8 in (300mm x 120mm x 70mm)

FCC Notice: Use of RF amplifiers in the United States is subject to FCC regulations. This device cannot be used with any transmitter other than the one it has been supplied with. This device requires professional installation. User is responsible for compliance with applicable laws and regulations

Installation and Operation Manual

The entire transceiver station assembly consists of seven main components :

1. Low-noise receive amplifier, transmit amplifier, bandpass filter, and switching control unit assembled in a sealed enclosure.
2. DC power injector. The power injector connects to the transmitting device and the amplifier assembly with a 10 ft. RF 50 Ohm coaxial cable.
3. 110-220 VAC Power supply with DC output BNC connector.
4. 10 ft. 50 ohm RF cable assembly.
5. One of 4 antenna models (omni, yagi, dish) as appropriate for installation.
6. Lucent Technologies Model: PC24E-00-FC WaveLAN 2.4 GHz wireless PCMCIA card .
7. Computer system.

The amplifier kit contains the following equipment:

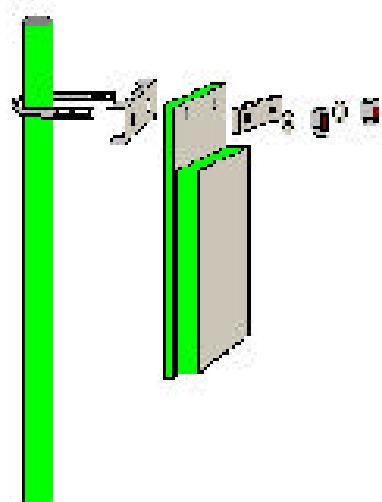
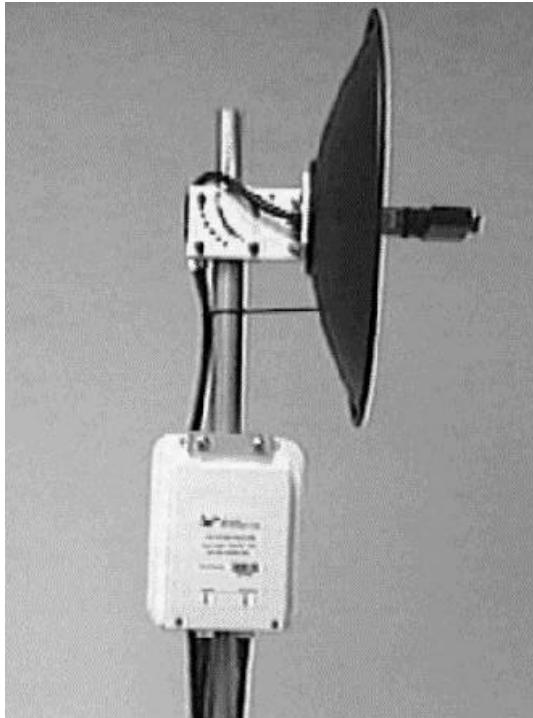
<u>Item</u>	<u>Quantity</u>
Amplifier	1
DC Power injector	1
Power supply	1
Mounting brackets	1
U-bolt	1

Installation Instructions

Important Notice:

Read the following installation instructions and all warnings carefully prior to installing the amplifier. Failure to follow installation instructions or tampering with the amplifier or the power supply will void the warranty.

1. Install the amplifier on a mast near the external antenna, using a U-shaped bracket (included). The amplifier can be installed vertically or horizontally.
2. Connect the side of the amplifier labeled “Modem” to the DC power injector, and the side labeled “Antenna” to a surge protector (not included) with the 10 ft., 50 Ohm coaxial cable. **Important:** In order for the amplifier to operate properly, and to avoid damage to the amplifier and the power supply, the maximum input power to the amplifier must not exceed 100mW. User must check for proper attenuation.
3. Connect the DC power injector to the external antenna port of the wireless modem card via a 50 Ohm coaxial jumper cable (included).
4. Following installation, a weather sealant must be applied to all external connectors to protect them from moisture (moisture can cause increased signal losses in the feeder, diminished transmission quality, and possible damage to the connectors and the amplifier).
5. **Grounding.** Ensure that the mounting mast is properly grounded. Check the ground on the amplifier assembly with a Ω -meter.



Warning:

Improper grounding can adversely affect amplifier performance and may lead to equipment damage or personal injury. Failure to properly ground the amplifier will void the warranty.

The amplifier does not have built-in surge protection, and is not designed to withstand a lightning strike. Use of a surge protector is highly recommended for outdoor installations. Amplifier warranty does not cover damage caused by lightning or static electricity.

Operation of the Amplifier

- On power up, the amplifier will be in a "receive" mode. The mode switches to "transmit" when the amplifier receives a signal from a radio modem. A Green light on the DC injector indicates that the amplifier has power. A red light on the DC injector indicates that the amplifier is in a "transmit" mode. The red light blinks when the amplifier is connected to a bi-directional RF device.
- A constant red light indicates that the amplifier is continuously in "transmit" mode and is not communicating properly. This is an abnormal condition that can be caused by any of the following:
 - *High noise level in the feeder of the transmitting device.* With time, some radio modems develop elevated natural noise levels, even in the "receive" mode. This noise can cause the amplifier to switch from "receive" to "transmit" mode, causing interruptions in communications. If this problem is detected, the transmitting device should be replaced.
 - *External interference.* If the amplifier is not properly grounded, external interference can cause the amplifier to intermittently switch to "transmit" mode. This condition has been observed with some radio modems, due to the modems' poor shielding characteristics. Thus, if the transmitting device is not adequately shielded, several such devices operating in close proximity can interfere with the amplifier's operation.
- If the red light does not come on at all, the cable could be defective, or the cable length may exceed maximum allowable length.

FCC Regulatory Notice

This device cannot be used with any transmitter other than the one it has been certified with.

Operation of RF power amplifiers in the United States is subject to the Federal Communications Commission's (FCC) regulations in accordance with 47 USC 302. User is responsible for compliance with all applicable laws and regulations.

This equipment complies with FCC Regulation 15.247, which specifies the license-free operation of direct sequence, spread-spectrum wireless communications devices. This device operates in the 2.4 to 2.4835 GHz frequency band reserved for industrial, scientific and medical applications. Since this device generates radio frequency waves, it may interfere with other radio signals in the same area unless the proper installation and operations procedures are followed. It has been proven in testing that this device complies with the limits of FCC Regulations that are designed to provide reasonable protection against such interference in a commercial environment.

Operation of this device with fixed, point-to-point systems (using the high gain yagi and grid dish antennas), as described in FCC Sections 15.247 (b)(3)(i) and (b)(3)(ii), excludes the use of point-to-multipoint systems, omnidirectional applications, and multiple co-located intentional radiators transmitting the same information. The operator of the spread spectrum intentional radiator or, the installer is responsible for compliance with this section.

NOTE: Installation and maintenance of this device must be performed by authorized **Winncom Technologies** personnel, or those persons properly trained and authorized to do perform such procedures. **Winncom Technologies** is not responsible for any damages, incidental or otherwise, in connection with use of this manual by anyone not described above.

CAUTION: In order to comply with **FCC adopted RF Exposure Requirements**, the authorized antenna must be installed in a manner that will provide a safe clearance distance from the antenna to any persons according to the following guide:

ANTENNA MODEL	SAFE CLEARANCE DISTANCE
WRO2400-70 7dBi OMNI	20 CM
WRO2400-125 12.5 dBi OMNI	20 CM
HGY15 13.5 dBi YAGI	21 CM
WRO2400-24 24 dBi GRID DISH	71 CM