FCC Part 15.247 Certification
Test Report

FCC ID: HSW-ZN241

FCC Rule Part: 15.247

ACS Report Number: 05-0173-15C

Manufacturer: Cirronet Inc.
Model: ZN241

Manual / Installation Guide

ZN-241

Base/Remote
Radio Network

Product Manual
for
Installers

CIRRONET

5373 Oakbrook Pkwy
Norcross, GA 30093
(678) 684-2000 main
(678) 684-2001 fax
www.cirronet.com

Important Regulatory Information

Cirronet Product FCC ID: HSW-ZN241
IC 4492A-ZN241

Note: This unit has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. 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 their expense.
Information to user/installer regarding FCC s Maximum Permissible Exposure (MPE) limits.

NOTE: THE MANUFACTURER IS NOT RESPONSIBLE FOR ANY RADIO OR TV INTERFERENCE CAUSED BY UNAUTHORIZED MODIFICATIONS TO THIS EQUIPMENT. SUCH MODIFICATIONS COULD VOID THE USER'S AUTHORITY TO OPERATE THE EQUIPMENT.

FCC s MPE Requirements

Information to user/installer regarding FCC s Maximum Permissible Exposure (MPE) limits.
Notice to users/installers using the following mobile antennas, with Cirronet RF products:

ZN241 5 dBi and 2 dBi Omni Antennas

The field strength radiated by any one of these antennas, when connected to Cirronet RF products, may exceed FCC mandated RF exposure limits. FCC rules require professional installation of these antennas in such a way that the general public will not be closer than 20 cm from the radiating aperture of any of these antennas. End users of these systems must also be informed that RF exposure limits may be exceeded if personnel come closer than 20 cm to the apertures of any of these antennas.

Getting Started

The ZN241 Radio network is designed for Point of Service (POS) transactions. The network consists of a server (ZN241-S) and many clients (ZN241-C). Both models use the same hardware with different software. One option for the server is two antenna outputs provided by a 2-way splitter with each output 3 dBm lower in RF power.

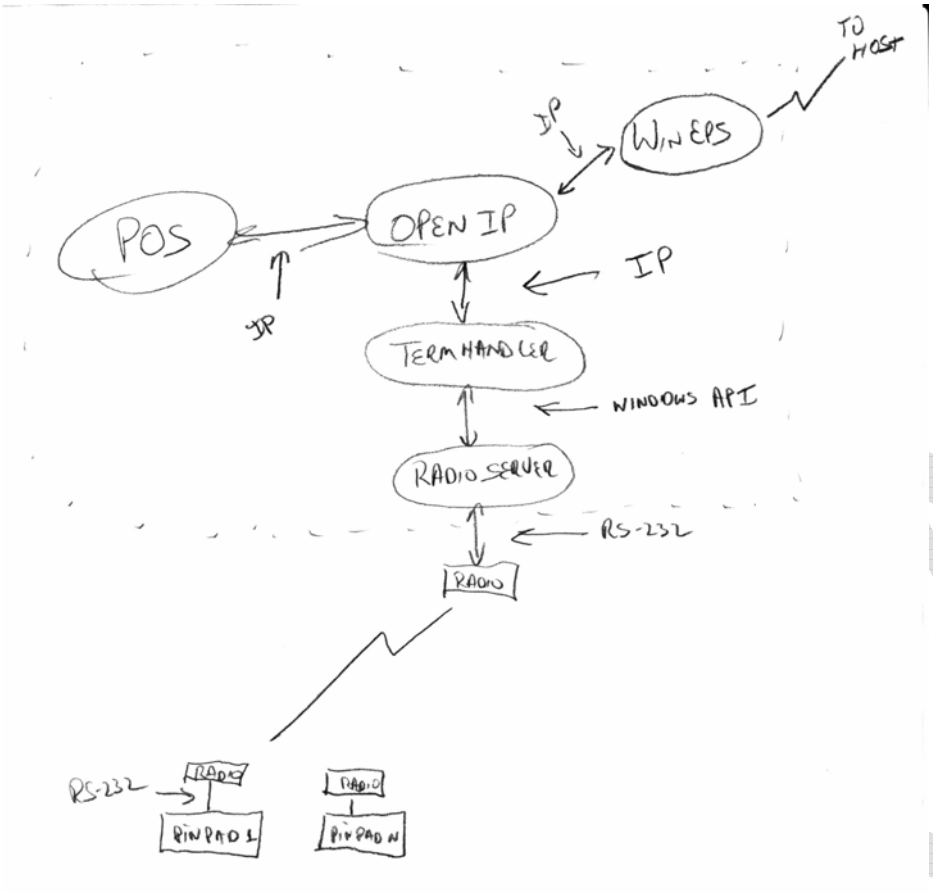
The ZN241 utilizes a Zigbee standard hardware module. The software is Cirronet's networking POS system.

The ZN241 has the following connections:

The antenna connector (RF) is located on the left side of the case, as shown above.

The RS232 and 6 Volt DC connection is on the right side of the case.

Figure 1 -- ZN241/Hypercom System Block Diagram



Frequency Selection

The ZMN2400 is not frequency agile during run-time, but it can select an unoccupied portion of the spectrum at startup from among the choices programmed into the Channel Mask. We believe the most likely source of interference would be from nearby 802.11b access points, which typically default to one of the following three channels:

802.11 Channel	Center Frequency (MHz)	Nominal Occupied BW
1	2412	2401-2423
6	2437	2426-2448
11	2462	2451-2473

ZigBee defines channel centers from 2405 to 2480 with 5 MHz spacing. Our strategy is to balance between keeping the number of possible channels as few as possible (to minimize variation from power-up to power-up) and to avoid possible 802.11b interferers. With this in mind, we can select three channels, one at 2480, completely above the three most common 802.11b channels, and two at the nulls between channels at 2425 and 2480:

ZigBee Channel	Center Frequency (MHz)	Nominal Occupied BW
15	2425	2422.5-2427.5
20	2450	2447.5-2452.5
26	2480	2477.5-2482.5

The channels in the 2.4 GHz band span from 11 to 26. Only these channels are supported by the ZMN2400.

Hardware Specifications

Radio Specifications

Operating Band	2400-2483.5 MHz
Radio Type	Direct Sequence (DTS), IEEE 802.15.4 PHY layer
Channel Bit Rate	250 Kbps
Channel Chipping Rate	2 Mcps
Modulation	MSK with Raised Cosine Filtering
Certification Type	DTS device per FCC 15.247 and ETS 300-328
RF power	+17 dBm typical, +15 dBm minimum
Receiver Sensitivity	-98 dBm typical, -95 dBm minimum
Link Margin	110 dB (approximately 3 Km Line of Sight propagation)
Adjacent Ch. Rejection	>39 dB with jammer @ 5 MHz offset
Spurious Output	Per FCC 15.247 and ETS 300-328

General

Input Voltage	5.5 volts minimum, 6 volts nominal, 15 volts maximum
Current Consumption (transmit)	70 mA typical operating, 180 mA peak
Operating Temp Range	-40 C to + 70 C
Humidity	95% Non-condensing
RF Connector	Reverse SMA
Host Connector	Male DB-9 (Amp 747840-3)
Power Connector	CUI Stack PJ-002A

Approved Antennas

5 dBi Collinear – Nearson Antennas

Nearson

Server
<<<<<
S-151AH-2450S

Colinear
5 dBi
7"
SMA
R/A Swivel

Client
>>>>>
S-151FL-36-AH-2450

Colinear
5 dBi
7"
SMA
Right Angle Straight Swivel