

# AP200 Rev2 Test Setup for FCC Certification

## Test Setup and Test Commands

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### CONTRIBUTORS

Name	Role
Senthil Palanisamy	Author



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## Revision history

Date	Revision	Changes
11/23/05	1.0	Initial Revision

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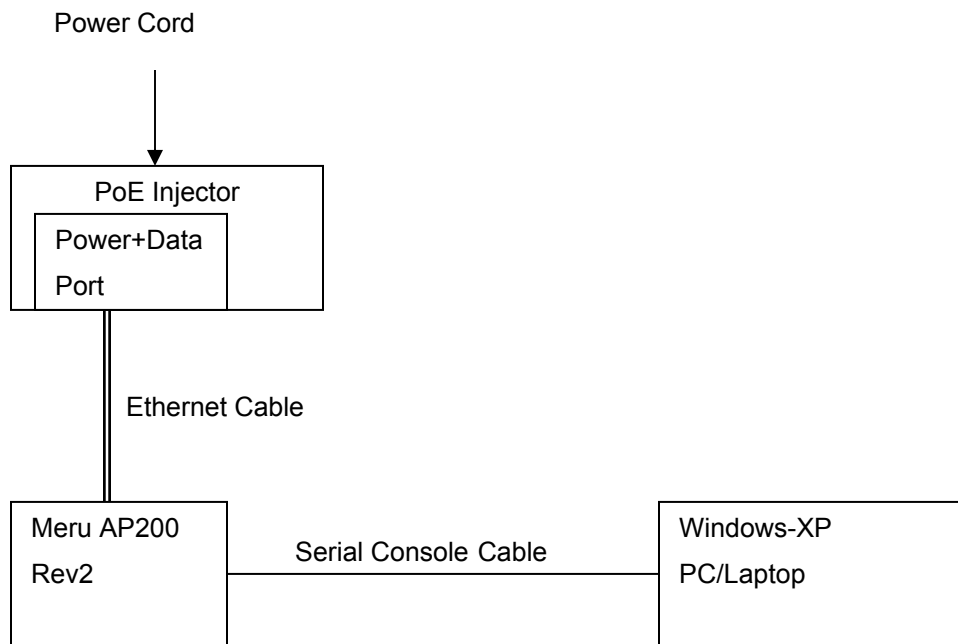
## Introduction

This document describes test setup, test commands and test procedures for emission related tests for Meru Access Point AP200 Rev2.

## Test Setup

Equipments needed:

- Meru AP200
- PoE Injector
- Windows-XP PC/Laptop
- Ethernet cable
- Serial Console Cable



**Figure 1: AP200 Test Setup**

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**Step 1: Setting up of AP200 and Windows-XP PC/Laptop**

1. Setup AP200 as shown in the figure
2. Run one of the serial communication programs available: Hyperterm or SecureCRT
3. Setup the serial link as:
  - Port: COM1 or available COM port
  - Baud Rate: 115200
  - Data Bits: 8
  - Parity: None
  - Stop Bits: 1
  - Flow Control: None
4. When the AP is powered up, the console messages are displayed in the window

*Note: AP is initialized with following environmental variables. These env variables will be used in the test commands. AP uses software version 3.1-98 or later.*

*env set bootcommand 'scan disable wmac0; scan disable wmac1'*

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## Step 2: Test Commands

This section describes the commands that can be used in the AP200 to run tests. In the commands, wmac0 refers to radio1 and wmac1 refers to radio2. Each radio is controlled independently.

1. To Login to the Console, use the following login and password

**login user root**

N0S3r1al

2. To change the channel of operation

**cfg set wmac channel <wmac0 or wmac1> <channel number>**

Available channel numbers:

802.11b/g: 1,2 ,3,4,5,6,7,8,9,10,11

802.11a: 36,40,44,48,52,56,60,64,149,153,157,161,165

Eg: To set the AP200 radio0 to channel 6, enter the following command in the Input Window:

**cfg set wmac wmac0 channel 6**

3. To change the output power of AP200

The output power of the AP200 can be changed with following command:

**vayu VayuReg <wmac0 or wmac1> Phycr 0x0000mm00**

**vayu phy <wmac0 or wmac1> write OFDM 0x0004 0xpppp0000**

This command controls the TX gain of the transmitter. The valid range of mm is from 0x00 to 0x1f. Also, I/Q correction for the tx gain should be applied. The I/Q correction settings for each band and tx gain vaules are given in a table below.

**Eg:**

**Vayu VayuReg wmac0 Phycr 0x00001700**

**vayu phy wmac0 write OFDM 0x0004 0x12340000**

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This commands set the tx power for the continuous transmission commands. Internal transmit power control loop can not be used with continuous tx mode. Hence the output power should be measured with power meter. The desired power settings are:

802.11b: 20 dBm

802.11g: 19 dBm

802.11a: 17 dBm

The correct gain settings for these power levels are determined using a power meter.

4. To Enable continuous transmission in OFDM mode, enter following command:

**vayu ctx-mode <wmac0 or wmac1> start 4**

**Eg:**

**Vayu ctx-mode wmac0 start 4**

5. To Enable continuous transmission in CCK mode, enter following command:

**vayu ctx-mode <wmac0 or wmac1> start 3**

**Eg:**

**vayu ctx-mode wmac0 start 3**

6. To disable the continuous transmission of the beacon frames, enter the following command:

**vayu ctx-mode <wmac0 or wmac1> stop**

**Eg:**

**vayu ctx-mode wmac0 stop**

7. To reboot the AP, enter

sys reboot

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### Step 3: Test Procedures

1. After the AP booted, enter login and password
2. To test TX:
  - Set the channel in radios
  - Set the appropriate gain settings for each radio
  - Enable continuous transmission in one or both radios
  - Do the measurements
  - Stop the continuous transmission
3. Stop continuous command should be issued before changing any transmit parameters.
4. Radio is set in receive mode when the tx mode is not enabled.

### Tx Power Setting for Emission Tests

The following table provides the tx power and tx gain settings for FCC testing.

FCC Unit #1: Radio1

Channel Number	Tx Power dBm	Tx Gain Setting	I/Q Correction
<b>802.11b</b>			
Channel 1-4	20	0x12	0xd820
Channel 5-8	20	0x13	0xd820



Channel 9-11	20	0x14	0xd820
<b>802.11g</b>			
Channel 1-11	19	0x19	0xe021
<b>802.11a</b>			
Channel 36	17	0x1C	0xdb04
Channel 64	17	0x1b	0xec0d
Channel 149	16	0x1a	0xe01c
Channel 165	16	0x1c	0xe323

FCC Unit #1: Radio2

Channel Number	Tx Power dBm	Tx Gain Setting	I/Q Correction
<b>802.11b</b>			
Channel 1-11	20	0x12	0x0206
<b>802.11g</b>			
Channel 1-11	19	0x18	0xfc06
<b>802.11a</b>			
Channel 36	17	0x1d	0x0bd8
Channel 64	17	0x1c	0x01cb
Channel 149	16	0x1a	0xf8ec
Channel 165	16	0x1b	0xfb6d

FCC Unit #2: Radio1

Channel Number	Tx Power dBm	Tx Gain Setting	I/Q Correction
<b>802.11b</b>			
Channel 1-4	20	0x12	0xd524
Channel 5-8	20	0x13	0xd524
Channel 9-11	20	0x14	0xd524
<b>802.11g</b>			
Channel 1-11	19	0x19	0xd722
<b>802.11a</b>			
Channel 36	17	0x1C	0xdb0f
Channel 64	17	0x1b	0xdb0f
Channel 149	16	0x1a	0xdc24
Channel 165	16	0x1c	0xdb1a

FCC Unit #2: Radio2

Channel Number	Tx Power dBm	Tx Gain Setting	I/Q Correction
<b>802.11b</b>			
Channel 1-4	20	0x12	0x0c34
Channel 5-8	20	0x12	0x0c34
Channel 9-11	20	0x13	0x0c34
<b>802.11g</b>			
Channel 1-4	19	0x18	0x0630
Channel 5-8	19	0x19	0x0630



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Channel 9-11	19	0x1a	0x0630
<b>802.11a</b>			
Channel 36	17	0x1c	0x1c30
Channel 64	17	0x1b	0x0d33
Channel 149	16	0x1a	0x1338
Channel 165	16	0x1d	0x1b3f