



***ELECTRO MAGNETIC TEST, INC.***

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***OWNER'S MANUAL / INSTRUCTIONS TO THE USER***



November 16, 2006

Federal Communications Commission  
7435 Oakland Mills Road  
Columbia, Maryland 21046

Gentlemen:

This is a letter of request for short term confidentiality under FCC Part 0.459 and Public Notice 04-1705 for the FCC application for the Wireless LAN Repeater, Model: WDF1001. WiDeFi, Inc. would like the Federal Communications Commission to keep the external photos, test setup photos, users manual, and internal photos confidential for 45 days from the issue date of the Grant of Equipment Authorization. WiDeFi, Inc. agrees to not market the product before the short term confidentiality expires, unless we contact the TCB prior to marketing so that the exhibits where short term confidentiality is requested can be released.

If you have any further questions or need additional information, please feel free to give me a call at 321-725-1520 x208.

Sincerely,

A handwritten signature in black ink that reads "Kenneth M. Gainey".

Kenneth M. Gainey  
Vice President Engineering



# Xtender Users Manual



## WiDeFi Confidential Information

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## **Radio Frequency Interference Requirements**

Note: This device has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna
- Increase the separation between the equipment and receiver
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected
- Consult the dealer or an experienced radio/TV technician for help

## ***Radio Transmitters (Part 15)***

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

## ***Class B Equipment***

This equipment has been certified to comply with the limits for a class B computing device pursuant to FCC Rules. In order to maintain compliance with FCC regulations, shielded cables must be used with this equipment. Operation with non-approved equipment or unshielded cables is likely to result in interference to radio and TV reception. *The user is cautioned that changes and modifications made to the equipment without the approval of the manufacturer could void the user's authority to operate this equipment.*

## **FCC Radiation Exposure Statement**

The antenna(s) used for this transmitter must be installed to provide a separation distance of at least 20 cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter.

***Radio Frequency Interference Requirements- Canada***

This Class B digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe B est conforme à la NMB-003 du Canada.

***Radio Transmitters***

This device complies with RSS 210 of Industry & Science Canada. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

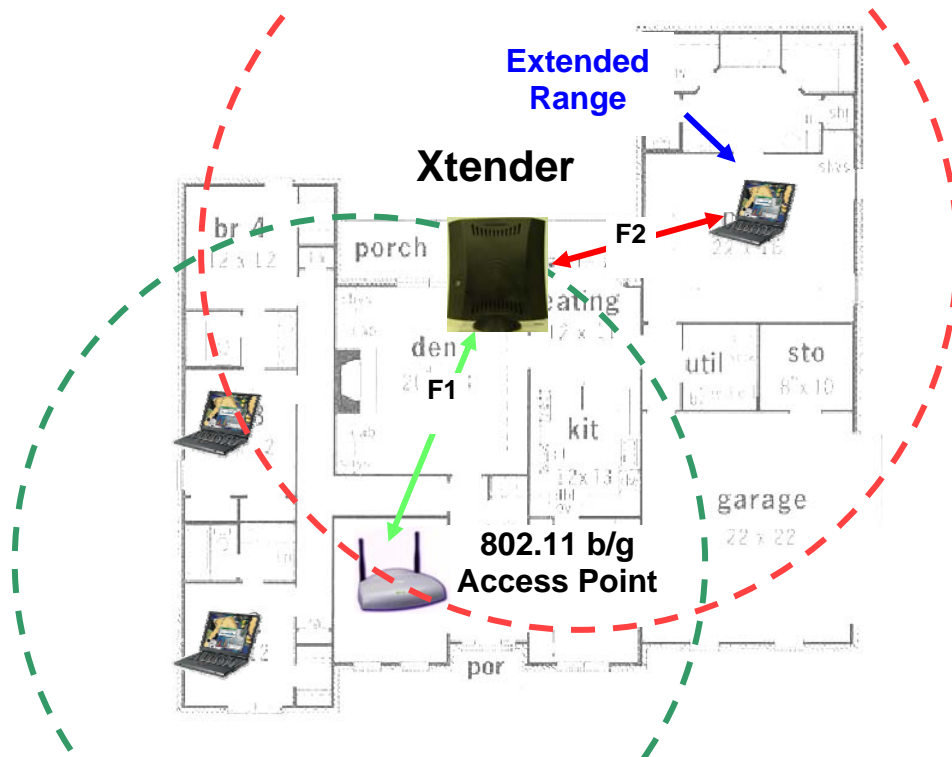
Label Marking: The Term "IC:" before the radio certification only signifies that Industry Canada technical specifications were met.



## Product Overview

Xtender™ is a full duplex, physical layer, Wi-Fi™ repeater designed to extend the range and throughput of an existing 802.11b, or 802.11b/g, Wi-Fi network operating in the 2.4 GHz Frequency Band. A patent pending architecture is leveraged to simultaneously transmit and receive 802.11b/g signals resulting in up to a 2x improvement in range.

This unique architecture enables range extension while maintaining full throughput and compatible with Quality of Service (QoS) and time sensitive applications. Xtender is also fully compatible with any Wi-Fi 802.11b or 802.11b/g certified Access Point or Client card and is compatible with 802.11i security protocols including Wi-Fi's WPA and WPA2.



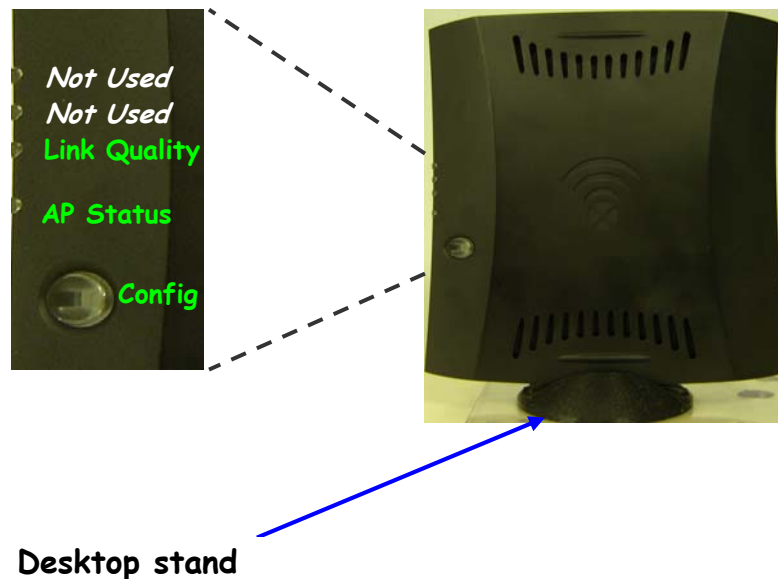


A Wi-Fi user experiencing coverage issues can increase range and throughput of their home network simply by installing Xtender half way between their access point and area with coverage issues.

Once configured, Xtender extends range and throughput coverage by amplifying and retransmits all Wi-Fi packet traffic received from the Access Points (or clients) on Channel F1 to a different Channel F2 as shown in Figure 1. At the same time, all packets received on F2 are amplified and re-transmitted on channel F1. A client who is located beyond the reach of an Access Point can now reach the Access Point through the repeater.

## Xtender Operation

Xtender is fully configured and operated using only one push button and two LEDs including: **AP Status LED** and **Link Quality LED**. LED operation is summarized in Table 1 below. The “Configuration” pushbutton is only used at initial setup to select or “Affiliate” with the desired Access Point to be repeated.





**Table-1 LED Operation**

LED	State	Indication
AP Status	Off	Unit is powered off
	Blink	Searching for the Access Point (not repeating), unit may need to be affiliated
	On	AP found, repeating packets, fully operational
Link Quality	Off	Xtender is too far from Access Point and needs to be relocated closer to the Access Point
	Blink	Xtender is too close to the Access Point and needs to be relocated away from the Access Point
	On	Excellent Connection

When Xtender powers up, the **AP Status LED** blinks indicating the system is completing initialization and is searching for the user Affiliated Access Point (AP) to be repeated. Xtender searches for this AP by scanning for its Beacon Strokes and MAC address that was preserved in Xtender Memory during the user initiated Affiliation Process.

Once the Affiliated AP has been found, Xtender automatically selects the best Wi-Fi channel to use as the repeat channel. This channel is selected to avoid other Xtenders, to minimize overlap with other WLANs, and to maximize performance.

After the Wi-Fi repeat channel has been selected, the **AP Status LED** turns solid **GREEN** indicating Xtender is up and running and is repeating the user specified AP to the automatically selected repeat channel. At this point, the **Link Quality LED** provides user feedback indicating that Xtender is either too close to the AP (LED Blinking), too far from the AP (LED Off) or is properly positioned relative to the AP. If the Link Quality LED is not solid **GREEN** (i.e. Xtender is too close or too far from the AP) Xtender should be relocated relative to the AP for better performance.

**Access Point Affiliation** - The user commands Xtender to enter AP affiliate mode by pressing and holding the user Configuration button until both the AP status LED and Link Quality LEDs begin to blink. In this mode the Xtender scans all available channels looking for the strongest AP beacon stroke based on Received Signal Strength (RSSI). Once identified, Xtender selects this AP as the Affiliated AP and then stores the AP's MAC address in flash memory. Xtender must be re-powered up at a new location to begin repeating the Affiliated AP.

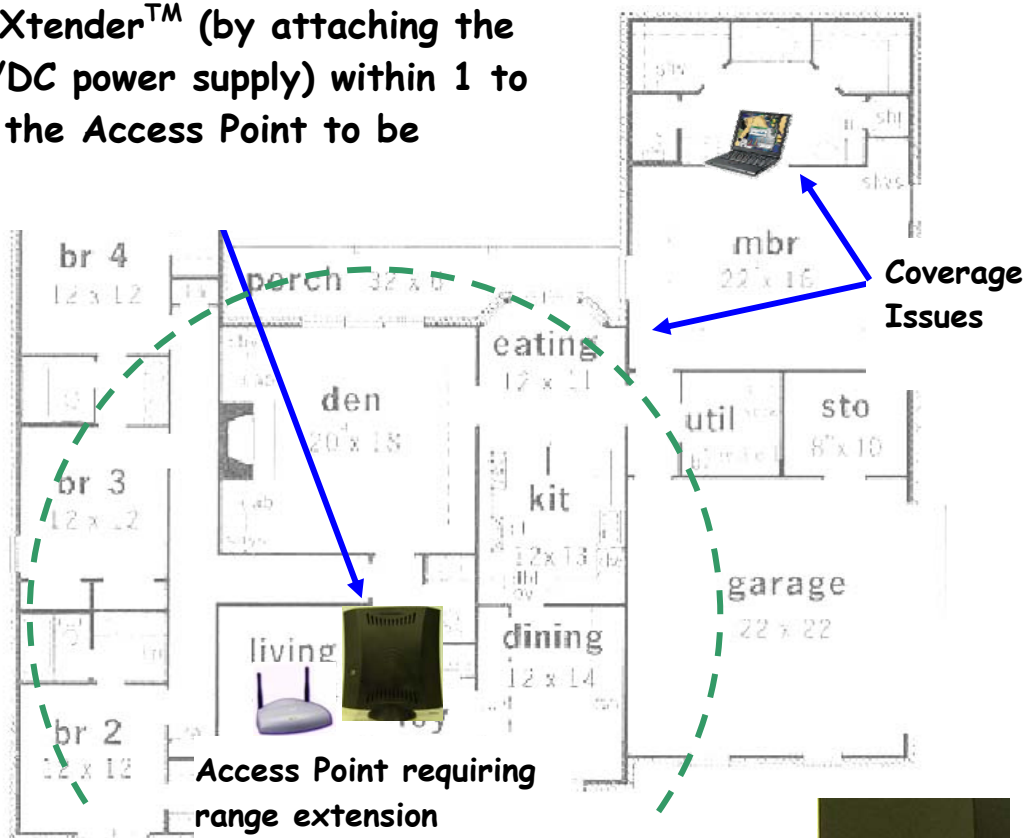




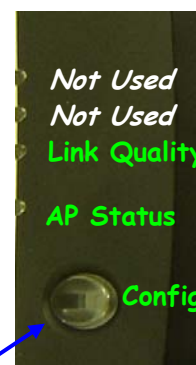
## Xtender Quick Install

**NOTE:** For best performance change your Access Point's configuration to operate on channel 1.

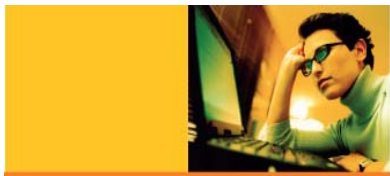
1) Power up Xtender™ (by attaching the external AC/DC power supply) within 1 to 3 meters of the Access Point to be repeated.



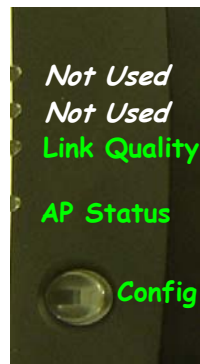
2) Enable AP Search Mode by pressing the Configuration Push Button for about 4 seconds until both the AP Status and Link Quality LEDs begin to blink in an alternating pattern. AP search continues for several seconds; once complete the alternating LED pattern stops.



Configuration Push Button



3) After AP search completes, verify Xtender found the Access Point by verifying that the AP Status LED turned solid **GREEN**. If the AP status LED is blinking, Xtender did not find the Access Point. Relocate Xtender closer to the Access Point and repeat 1 and 2.

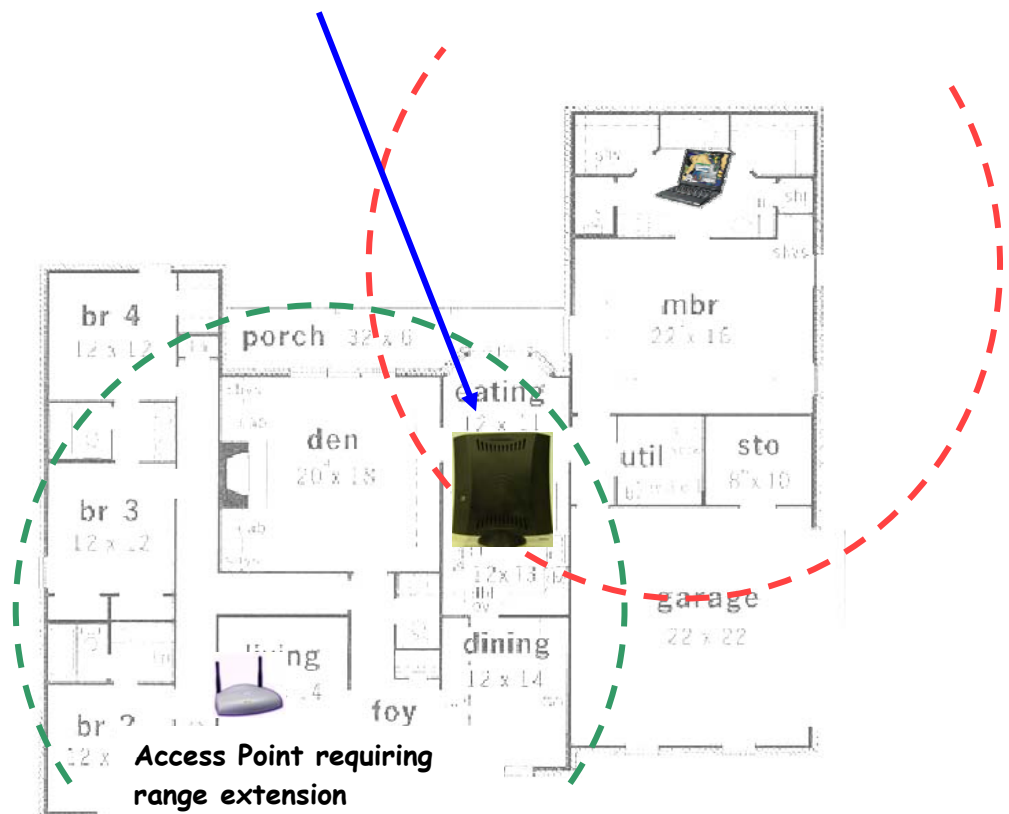


AP Status LED

Solid GREEN: Access Point Found

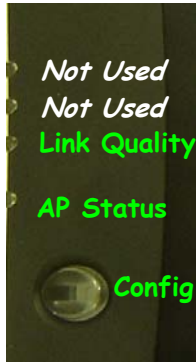
Blinking: AP not found

4) Relocate and power-up Xtender mid way between the Access Point and area requiring range extension.





5) After 30 to 60 seconds verify the AP Status LED is solid **Green** indicating Xtender found the Access Point. Congratulations, you successfully completed the installation and are now REPEATING PACKETS!



#### Link Quality LED

**Solid GREEN:** Good Link!

**Blinking:** Xtender is too close to the AP

**Off:** Xtender is too far from the AP

#### AP Status LED

**Solid GREEN:** Access Point Found

**Blinking:** AP not found

#### Notes:

- If the AP status LED is blinking after 60 seconds, power-up Xtender in a new location closer to the Access Point
- If the Link Quality LED is OFF, Xtender is too far from the Access Point, relocate to a position closer to the Access Point
- If the Link Quality LED is blinking, Xtender is too close to the Access Point, relocate to a position further from the Access Point
- Xtender performance can be maximized by setting your Access Point channel to 1 instead of 6 or 11



## Specification Summary

Requirement	Specification
RF Characteristics	
Standards	IEEE 802.11b and 802.11g
Data Rates	802.11b: 11, 5.5, 2, 1 Mbps (Only 1 and 2 Mbps are required for internally generated control packets) 802.11g: 54, 48, 36, 24, 18, 12, 9, 6 Mbps (No internally generated OFDM packets are required)
Modulation	802.11b CCK (11, 5.5 Mbps), DQPSK (2 Mbps), DBPSK (1 Mbps) (Only 1 and 2 Mbps are required for internally generated control packets) 802.11g OFDM (No internally generated OFDM packets are required)
Sensitivity	-80 dBm @ 1 Mbps; -76 dBm @ 11 Mbps -80 dBm @ 6 Mbps; -65 dBm @ 54 Mbps
Operating Frequencies	2.412-2.462 GHz
Operating Channels	Channels 1-11 (US and Canada)
Minimum allowable full duplex Repeat Channel Separation	Minimum of 5 channel separation between AP channel and repeat channel Note: This is automatically controlled
Average RF output power	5 channel spacing + 8 dBm 6 channel spacing +12 dBm 7 channel spacing +12 dBm 8 channel spacing +13 dBm 9 channel spacing +14 dBm 10 channel spacing +14 dBm
Gain deviation across 2.4 GHz band	< 3 dB
Receiver Noise Figure (NF)	8 dB Max
Dynamic Range	97 to 100 dB
RF Input Range	-40 dBm to -82 dBm
Packet Delay	< 1 usec
Network Architecture	Infrastructure Mode and AD-Hoc Mode
Security	64/128 Bit WEP, 802.11i, WPA, WPA2, Proprietary
Buttons	Single Button Configuration
LEDs	2 LEDs (AP Status, Link Quality)



## Contact Information

For additional questions or comments please call or email:

WiDeFi Inc

Email: [info@widefi.com](mailto:info@widefi.com)

Office: 321.725.1520