

# SOUND+VISION.

## Amped Wireless REC10 Compact High-Power Wi-Fi Range Extender

**PRICE** \$70

### AT A GLANCE

#### Plus

Small, concealable form factor  
Easy installation with good documentation  
Excellent performance

#### Minus

May cost as much as a new router



### THE VERDICT

There may be other options for improving your Wi-Fi, but the REC10 represents an exceptionally simple and effective path to robust video streaming on SmartTVs and tablets.

With Internet-connected smart TVs flying off the shelves during the holiday season and into Super Bowl Sunday, many consumers may find themselves trying to stream music and video to their new sets from Pandora, Netflix, Amazon VOD, et. al. But relatively few will have a wired ethernet connection near their televisions, and nothing can dumb down a smart TV faster than a weak Wi-Fi signal. Weak Wi-Fi can have immediate and noticeable effects on your audio and video quality. To compound the problem, you may not even know what's causing them. An inability to connect promptly to your desired services may indicate that your router is too far away. But a laptop in the same room might have no trouble at all loading web pages, and a reasonable person might think the stuttering, buffering, or lack of resolution on your TV screen is a function of heavy Web traffic during peak periods, bad infrastructure at your Internet provider, or a technical failing of the playback device.

In my work as a custom electronics installer I sometimes found that a Wi-Fi signal booster (also called a range extender) could make the difference between poor quality streaming (or none at all) and acceptable performance. These units typically receive the existing signal from your router and rebroadcast it. By physically placing the booster somewhere between the router and your most distant device, you effectively extend the router's range.

Of course, there may be other and possibly better options than a booster for solving the problem of poor Wi-Fi coverage. If you've got an older router that's not working on the 802.11n standard (or the emerging 802.11ac standard), upgrading will undoubtedly increase your data throughput/speed, though not necessarily your range, since the less-crowded 5 gigahertz Wi-Fi band used in n-standard routers may also

reduce a signal's ability to pass through walls and other common obstructions compared with older 802.11g routers on the traditional 2.4 GHz band. (Ditto for dual-band routers, for the same reason). There are also wired network extenders that send ethernet over your power lines or cable TV infrastructure (MoCA), though these require plugging in adapters at both the router and destination device, and they're subject to their own peculiar gremlins as well.

Furthermore, extenders have their own achilles heel. While they should successfully extend the reach of your network, by their nature they chew some network speed: having to grab the original signal packets and rebroadcast them takes more time than would be required for a simple direct connection from the router to the destination device. Still, for sheer simplicity of installation, dropping in a Wi-Fi extender may be the easiest (though not always the cheapest) way to go from an unviable streaming network to one that works. Your personal usage habits will determine how much throughput speed you really need, and your own tech savvy and comfort with swapping in new routers or adding wireless access points (which may accomplish the same goals more efficiently) will likely come into play in selecting the best option for you home.

### **Extend Me, Please**

As it turns out, my basement home office and theater studio is perfect for testing a Wi-Fi extender. My modem and wireless router live two stories up on the second floor, but I long ago ran (with considerable effort) a direct-wired ethernet connection to the studio for displays and other components in my A/V rack. That's allowed me to extend the life of my router, a now long-in-the-tooth Linksys WRT54GS2 that runs on 802.11g/b. Its Wi-Fi function is still used by my Mac laptop in the basement, where it's proven itself perfectly adequate for email and general web surfing, and for gaining Wi-Fi access around the house on portable devices like my iPhone and iPad. From experience, I've found that Wi-Fi straight from the router is also effective for streaming internet radio to the laptop or my Oppo BDP-103 Blu-ray player (using the Oppo's supplied Wi-Fi dongle adapter). But all attempts I've made to wirelessly stream video from the router—whether it be low-res YouTube clips or high definition Vudu presentations—have met failure. The load and command response times for any video streaming app I launch on the Oppo or on any flat-panel HDTV is noticeably sluggish, and even if the app eventually loads, it inevitably gets hung up at some point when I try to play videos.

These were the conditions when Amped Wireless, which specializes in high performance Wi-Fi boosters and routers, sent me their REC10 high power Wi-Fi range extender to try out. With a 600 milliwatt transmitter, it's said to be 12 times as powerful as typical Wi-Fi devices, which usually have about 50 mW of output. The unit also has a higher-gain antenna compared with the typical router. Amped claims a coverage footprint of up to 6,500 square feet for the REC10, versus 1,500 square feet for a conventional router. It can be used to extend any 802.11 n, g, or b network. The suggested retail price is \$70, and it's available from most of the reliable online vendors (Amazon, et. al.). If you're already running a dual-band network, Amped Wireless also makes the SR20000G (\$160 list; \$140 street), which can simultaneously boost a 2.4 GHz and 5 GHz network with the same 600 mW of output power for each; range is claimed to be up to 10,000 square feet.

Upon opening the box, I found the REC10 both surprisingly compact and thoughtfully designed. It has a nicely styled white case that's not much larger than a cigarette pack and features rounded corners on the front and beveled side panels. It plugs directly into a wall outlet using the prongs extending from its backside. This is a desirable feature for an extender that I prefer to a two-piece system with a separate wall-wart power supply. That arrangement requires that you find a spot near an outlet for the booster on either the floor, a table, or a shelf, and it leaves an obvious wire exposed. Aesthetics can be critical with an extender because it may have to live in a hallway or room devoid of other electronics and where it can't be easily hidden. The REC10, once plugged into a common white outlet, virtually disappears. If you plug it into the lower half of a duplex outlet, even the short white antenna extending from its top will blend in with the wall plate, and the antenna's far right-side position ensures you'll still have room to plug in another appliance above the extender. As an added bonus, there's a single RJ-45 ethernet port on the bottom panel which can be used to gain wired network and Internet access for another device situated near the extender, which may come in handy in some situations.

Setting up the REC10 was really a piece of cake. The Amped setup guide documentation was excellent—well illustrated, clearly written, and unintimidating, and their wizard software was intuitive and simple to follow. They also supply a how-to video on disc, but I never got close to tapping it. You basically just screw on the antenna and plug in the extender where you think it might best work for you, at which point an Amped Wireless logo softly glows from the unit's front face to let you know it's powered.

Amped recommends you find a spot that captures about 70 percent of your full signal strength from the router. Their software will tell you if you're there, but if you want to move it after setup to a more ideal location you can just unplug it without losing your settings and put it in another outlet anywhere inside your router's transmission footprint. I chose an outlet in my dining room that's on the main floor of the house, directly above my test studio and almost directly below the router location upstairs. It showed 82 percent signal strength in the Amped setup software, a figure obviously calculated from whatever Amped uses as its reference for 100 percent, full signal strength. This gave me more than enough signal for a solid rebroadcast.

Once the REC10 is powered, it broadcasts its own temporary Wi-Fi network. You connect to that on your Wi-Fi equipped computer (or any iOS or Android phone or tablet), then enter the REC10's setup wizard by typing in a supplied URL on your web browser. From there, just follow the prompts to select the network you wish to extend, create a name and password for the extended network (to make life simple, it can have the same security key you currently use for your existing network), then hit the button and wait for the software to complete a countdown and give you your cue to reconnect to the new, extended network.

The whole process should typically take about 10 minutes. However, the software repeatedly got hung up in the countdown when I tried to connect to the REC10 wirelessly in this prescribed fashion. As an alternative to wireless setup, the instructions suggest using an ethernet cable (supplied) to directly link the REC10's ethernet port to your computer. This was easily accomplished by moving my laptop to the REC10's new location and completing the setup there. That solved the problem, and afterward I was able to fully disconnect from the REC10 and use it normally. Another alternative is to do automatic pushbutton setup if your router has Wi-Fi Protected Setup (WPS) features.

The REC10 has some additional features you can tap from its browser setup menu. For example, you can create a dedicated guest network with different security settings from the primary extended network. You can also schedule when Wi-Fi is on or off, lock out specific users/devices from the extended network, and adjust the power output to reduce the wireless coverage if you desire a smaller broadcast footprint. I left all of these in their default settings.

### **Let the Games Begin**

To test the REC10, I downloaded a popular freeware program to my Mac called iStumbler that's used to locate nearby Wi-Fi networks and establish their comparative signal strength. This was very helpful for first establishing the baseline signal strength coming straight from the router and then quantifying the improvement with the REC10. But to understand how real-world performance changed, I also tapped the Oppo's built-in Vudu streaming app and streamed some movie previews from the service with and without the REC10. This also allowed me to use the Oppo's integrated Wi-Fi signal strength meter to further compare the two networks, and to use Vudu's network test feature to measure throughput. All Vudu apps on any playback or streaming device have this function to allow users to determine which of Vudu's offered video resolutions the network connection can handle without excessive buffering or degradation of image quality—standard def 480p, high def 720p, or full HD 1080p.

Firing up the Oppo also proved elucidating. The Blu-ray player's Wi-Fi signal strength meter (yet again, using whatever scale or reference is inherent in the Oppo firmware) showed the unenhanced Linksys network delivering 41% signal strength to the Oppo's outboard USB Wi-Fi dongle. But it measured signal strength for the extended REC10 network as anything from 71 percent to as much as 90 percent at various times during my testing!

The Vudu throughput tests further hinted at what proved to be a notable improvement in performance that became evident later in my streaming sessions. Without the REC10, Vudu network testing actually proved impossible, at least at the time I tried to conduct the test. Repeated attempts to run it resulted in the same error message: “Testing Incomplete: Speed Testing could not be completed due to network problems. Please test again.” Switching over to the extended REC10 network resulted in several successful tests showing about 5.5 megabits per second speed on a scale that maxes out at 9.0 mbps. Anything above 4.5 mbps is considered good enough for streaming HDX—Vudu’s full resolution 1080p service. Needless to say, upon seeing this, I was anxious to see how the REC10 would affect the day-to-day streaming experience.

### Real-World Streaming

My real-world evaluations involved several tests applied to both the unenhanced and the extended network. The first thing I checked was the load time of the Oppo’s Vudu app on each. Upon booting up the app, there’s usually a delay while it connects to the service, then loads the home screen with the latest movie selections. Once the app was loaded, I timed the period it took to buffer and begin playing a couple of free 2-minute previews that Vudu offers for most movies, arbitrarily selecting *White House Down*, and *Ironman3*, and opting for the full HDX resolution as my default. I also watched a trailer for the latest *Thor* installment. Along with timing how long it took each preview to load, I subjectively looked for differences in image quality.

Right off the bat, I registered clear differences in the load time required for the Vudu app to come up to its home screen. With the straight router, the app initially failed to load at all, but on the second attempt and additional attempts I timed approximately 35-36 seconds from the moment I hit the select button to when the Vudu home screen was fully loaded and ready for navigation. By comparison, the REC10 extended network loaded in about 19 or 20 seconds—nearly twice as fast. Promising, indeed.

As I moved on to the trailer for *Thor: The Dark World*, I wasn’t surprised to find that Vudu couldn’t even load the HDX version from the unassisted network. After 35 seconds of Vudu’s busy icon spinning around, an error message popped up: “Your network speed is insufficient for uninterrupted playback at this quality. We recommend you select a lower quality to continue watching.” As long as I continued to let it run, the same message popped up every 30 seconds until I or the system finally aborted. I encountered the same issue with both the 720p and 480p versions as well; they just never played.

I moved on to the 2 minute preview of *White House Down* and had better luck. Selecting the HDX option, I watched the preview begin playing 21 seconds after initiating the load. It played at what appeared to be good video quality up till the 1:50 mark, then stopped to buffer the remainder of the preview. The picture never came back, only a “network error...try again later” flag. The 720p version took the same amount of time to load (22 seconds) and played this time to the end of the 2:36 preview, albeit with somewhat disappointing image quality on a 60-inch Panasonic ST60 series plasma, evident as a less detailed and slightly more blocky picture.

The pattern was similar for the *Ironman3* preview. The unassisted network wouldn’t play the HDX at all, but the 720p version loaded and began playing in 21 seconds, then kept going to the end of the preview at 2:34. Again, the 720p quality had a slightly soft and noticeably blocky quality, with aliasing (jaggies) evident on the comic-like “Marvel” credit that appears early in the film. Clearly, the most I was getting out of Vudu from my existing network before the booster was 720p, and not without buffering and artifacts.

After this experience, switching over to the extended REC10 network was like unleashing a tiger. Along with the Vudu app loading nearly twice as quickly, all three of my HDX test clips loaded super fast—each in about 6 seconds, vs the 20 or 21 seconds it took to load HDX or 720p HD with the unaided network. They all played through to the end with no buffering, and the video quality was extremely clean and detailed, with noticeably fewer jaggies on diagonal lines and little evidence of block artifacts. Once I was on the new enhanced network, I went back and played the clips at 720p as well, and while I suspect most of the differences between the HDX 1080p and HD720p playback could be attributed to the native signal

resolutions and the display's handling of the required 720p to 1080p upconversion, I definitely saw subtle improvements in both detail and motion with the 720p delivered by the REC10 versus the unaided network.

### **Saved By The Bits**

Short of installing a new 802.11n router and checking its performance against my REC10-assisted 802.11g model, it's hard to know if the \$70 I might have spent on the REC10 would have been better invested in a new router. Also, I can't say whether you or anyone else will get the same results with the REC10 that I did, thanks to the vagaries in distances, obstructions, RF interference and other Wi-Fi variables that affect different homes. Nonetheless, the REC10's excellent performance in my real-world evaluation was undeniable. It took an aging Wi-Fi router that was virtually unusable for video streaming in my media room and, with a bare minimum of effort, turned it into a robust wireless network that had no trouble streaming full HD 1080p content with essentially no sacrifice in image quality or buffering, even on the full length movies. I can imagine thousands of families facing the same situation when they bring home their new Internet-connected HDTVs, Blu-ray players, or tablets. For many of them, this compact, easily installed, and conveniently hidden little box may be just what the doctor ordered.