



Operation Notes

Your IslandTime HP Wifi system is setup and ready to plug into your computer or wireless router. The administration pages of the bridge contain many functions that are not pertinent to the reception of signals from internet hotspots. These notes are to acquaint you with the functions that can be used to fine tune reception.

Whenever changes are made to an administration page you must click the “**change**” button at the bottom of the page and then click the “**apply**” button that will appear at the top of the page. A progress window will appear and the changes will be made.

Output Power

The ITCB (IslandTime Client Bridge) is capable of output power up to 800-1000 mw. The highest output power is not necessarily the best setting to use for all situations.

The output power is set on the “Link Setup” tab.

The screenshot shows the AirOS web interface with the 'Link Setup' tab selected. The 'BASIC WIRELESS SETTINGS' section is visible. The 'Output Power' setting is highlighted with a yellow oval. It consists of a slider and a text input field set to '26 dBm'. There is also a checkbox for 'Obey Regulatory Power' which is currently unchecked. Other settings include 'Wireless Mode' set to 'Station', 'ESSID' set to 'Stanley Wireless', 'Country Code' set to 'United States', 'IEEE 802.11 Mode' set to 'B/G mixed', 'Channel Spectrum Width' set to '20MHz', and 'Channel Shifting' set to 'Disabled'.

The power can be changed by grabbing the slider and moving it or by directly entering the desired value. The power is measured in “dbm” (decibels referenced to 1mw). This is a logarithmic scale so small changes produce big results. Basically every 3db increase doubles the power output.

- 20dbm = 100mw
- 23dbm = 200mw
- 26dbm = 400mw (default setting at time of shipping)
- 29dbm = 800mw

Power settings are accurate to +/- 1dbm.

I like to start at 26 dbm when out at anchor. This will usually give good results. If you aren't making a connection when you think you should then try a higher setting. When you decide to raise the power you are making the assumption that the access point cannot hear your transmission.

You can get an idea of whether you need more or less power than 400mw from the signal strength you see when you do a scan. The signal strength is measured in negative numbers with larger negative numbers indicating a weaker signal than smaller numbers. -90dbm is weaker than -80dbm.

If you are trying to connect to a station with a signal strength in the low -90's you should be using your highest power setting. This is a very weak signal approaching the limits of your receiver which is much more sensitive than most common office grade AP's that you will encounter along the waterfront. Because they have less receive sensitivity your bridge will have to "shout" louder to be heard by the AP.

In the -80's you will probably do fine using 26dbm and from the -70's on down you will generally not need power greater than 26dbm. There are always exceptions and these can be dealt with by increasing power.

If you get too close to the access point such as when your in a marina that has AP's out on the docks you definitely want to decrease power. Too much power can degrade you connection by overloading the AP's receiver. This can slow your throughput or even prevent the connection.

To the right of the power slider is a check box called "Obey Regulatory Power". This check box works in conjunction with the "Country Code" higher up the page. When this is checked the ITCB output power will automatically be held to the legal power allowed by the particular country. Your ITCB is capable of power output above the legal limits of many country's.

The "Country Code" box is important for setting the number of channels available. This varies from 11 in the US, 13 in most of the EU to 14 in Japan. The channel frequency for channel is the same for each country but if you have the code set to United States and you are in France you'll be missing 2 channels that may be available.

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ADVANCED WIRELESS SETTINGS

Rate Algorithm:

Noise Immunity: Enabled

RTS Threshold: Off

Fragmentation Threshold: Off

Distance: miles (4 km)

ACK Timeout: Auto Adjust

SuperG Features: Fast Frame Bursting Compression

Multicast Data: Allow All

Multicast Rate, Mbps:

Enable Extra Reporting:

Advanced tab

There are several settings on this tab that can affect your connection.

Rate Algorithm: The choices are Conservative, EWMA (Exponentially Moving Weighted Average) & Optimistic. Conservative is best for weak signals, EWMA is for moderate signals and Optimistic is best with strong signals. These are mathematical formulas that attempt to maintain the highest data flow for given conditions.

Noise Immunity: When you check this box the bridge will function better in high noise environments. If you have a large number of AP's in your area you should use this box. Noise comes from wireless keyboards, bluetooth devices and any other device operating in the 2.4Ghz. Band.

Distance & ACK Timeout: These are related values. When your ITCB receives a frame of data from an AP it sends an ACKnowledgement back to the AP if the data is error free. The ACK number is the time that the AP waits for the acknowledgement before resending the data. If the ACK time is too short the data rates will be poor or the connection will not work at all.

The ACK time on the ITCB is set to AUTO since you usually do not know the distance to your AP . In the case of very weak signals or a very noisy environment you can improve reception by setting the ACK to a fixed value if you know the distance to the AP. If you know where the AP is you can get a distance from your GPS. Set the "Distance" slider to 120% of this distance.

Detailed information on all parts of the administration pages can be found online at

<http://wiki.ubnt.com/wiki/index.php/AirOS>