

## **Manual for low radiation wireless access point with JRS eco-wifi 04AC firmware**

### **Introduction**

Less radiation, same performance. Share the Internet throughout your home or office while minimizing your exposure to electromagnetic radiation, with the low EMF wifi firmware from JRS.

Did you know that normal Wi-Fi® routers for wireless internet unnecessarily transmit a signal 10 times per second and 24 hours per day, even when they are not used? The solution is a low radiation wifi router. These routers come with the unique JRS eco-wifi firmware installed: an operating system that reduces electromagnetic radiation with a factor of 90% in stand-by. This reduces exposure to electromagnetic radiation from the router by a factor of 10, measurably.

- Reduce wifi radiation by 90% in standby:  
pulse frequency reduced to only once per second.  
Connection throughput and network stability remain the same.
- Options for completely (100%) turning off wifi radiation:
  - Scheduled wifi switch-off (for example during night time)
  - Manual on-/off-switch for wifi transmitter.
- Fine adjustment of range with 1 milliwatt step size:  
achieve up to 95% reduction in transmit power.

All functions of your existing ADSL, cable or glass fibre modem, like for example internet telephony, can still be used. You connect the wifi router to your modem using a standard network cable. Next, the wifi function of your existing modem needs to be switched off in its configuration page, because this function is taken over by the eco-wifi router.

*The exposure to EM radiation from the laptop or other wirelessly connected equipment remains unchanged. You may be able to reduce the transmit power of your computer's wifi adapter with the Windows® Device Manager. A wired internet connection is radiation-free and minimizes health risk.*

## Default password

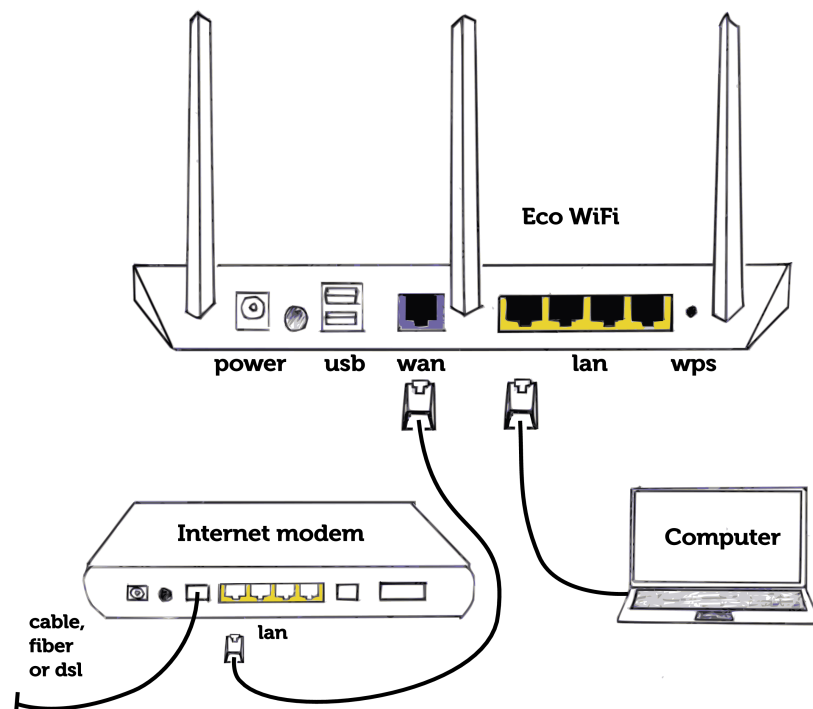
By default, the accesspoint is set up with wireless security activated. Therefore you need a password to connect to the wifi accesspoint using wireless, and also for logging into the configuration page. This is also the default username/password after a reset (see at the end of this manual):

-**username:** root (only required for logging into the configuration page)

-**password:** ecowifi!

## Connecting your eco-wifi router

Your Internet modem needs to remain in place. The picture below shows how to connect the eco-wifi router to the Internet modem.



1. **Connect the included patch cable from the blue WAN port of the eco-wifi to a free LAN port of your Internet modem.**
2. **Mount the antennas on the eco-wifi. Connect the power adapter and plug the adapter in to a power outlet.**
3. **Important! Switch off the built-in wifi of your Internet modem (if applicable). If you don't know how, ask the customer service of your provider for help.**

**You now have two options to connect your computer or other device to the router. Using the LAN ports of the eco-wifi you can make a wired connection. You can connect wirelessly to the eco-wifi using the default password 'ecowifi!'.**

**It is strongly recommended to change the wireless security password immediately! To change the wireless security settings and the password, in the eco-wifi configuration page go to the menu Basic → Network. Fill in the new password under 'shared key'. Please note that now you need to connect again using the new password in your laptop/smartphone etc. wireless settings! If you have trouble connecting, please take a look at 'Troubleshooting' on the last page of this manual.**

### **Opening the router's configuration page**

1. You can choose between connecting to the eco-wifi router with a cable or by using wireless. If you are using wireless: enter the default password ('ecowifi!') or your changed wireless security password.
2. Start your web browser.
3. Type into the web browser address bar: <http://192.168.4.1>.
4. To log into the configuration page, use username: **root** and admin password: **ecowifi!**

**You may change the administrator password if desired.** You can do this in the configuration page in the menu Administration → Admin Access ('password' at the bottom of the page).

### **Transmit power setting**

To reduce the radiation even further, you can lower the transmit power. (Router's range is reduced).

From the perspective of minimizing health risks, the transmission power is best set to the lowest value at which the desired wifi coverage is achieved reliably, and no higher. This depends on the size of your office/house, the type of walls and floors (wood/stone/reinforced concrete), and the quality of the wifi-receivers in the used laptops/tablets/mobile phones etc.

1. Go to the menu Advanced → Wireless in the eco-wifi configuration page.
2. Change the Transmit Power field. The lowest possible setting is 1mW. The actual measured transmission power at that setting (measured by JRS) is a factor of 10-20x below the default setting. The lower the setting, the lower your exposure to EMF.

**The nominal setting is 30-40mW. Do not use a higher setting than 70mW.**

## Manually turning on and off the wifi-signal

Using the 'WPS' push button on access point, the wifi signal can be manually turned off, while the LAN-/ethernet-ports keep functioning. The wireless radiation is completely disabled (100% radiation reduction). You can just keep working using the wired LAN-/ethernet-ports on the accesspoint. Keep the button pressed for one second until the power light goes off. Then release it again. If the Wi-Fi indicator light goes off, the Wi-Fi radio is turned off. To turn the radio back on, follow the same procedure.

After powering the access point on, the wireless is enabled.

The eco-wifi does not support Wireless Protected Setup (original function of WPS button).

## Set times at which the wifi-radiation is automatically turned off

1. Go to the menu Basic → Time. Set the Timezone to your zone.
2. Go to the Access Restriction menu in the configuration page.
3. Click Add.
4. Click on the radio button for 'Disable Wireless' and fill in the desired times.

To switch on wifi manually during off times, keep the WPS push button on the back side of the router pressed for one second as described above. The router will resume its on/off schedule at the next set time.

## How to maximize the throughput speed of the eco-wifi 04AC

– Set Bandwidth to 80MHz in the menu Basic → Network and click 'save'.

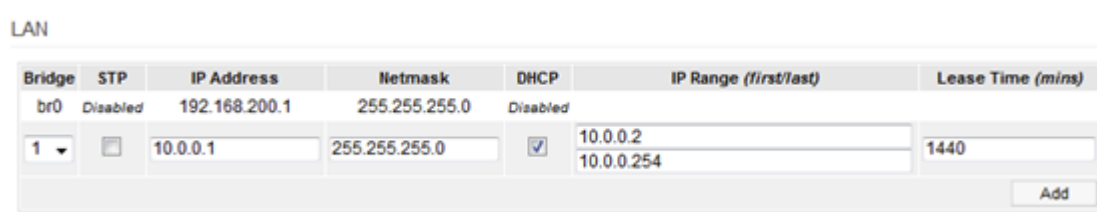
## Turning on USB and Network Attached Storage (NAS) support

1. Go to the eco-wifi configuration page, to the *USB and NAS* menu.
2. Check whether *Core USB Support*, *USB 2.0 Support* is checked.
3. Check *USB printer support* if required.
4. Check whether the filesystems you will be using are checked (in most cases *FAT*).
5. Check whether *Automount* is checked.
6. Go to the submenu *File Sharing*.
7. Check *Yes, no authentication*.

## Set a guest network on the eco-wifi

Adding of additional networks ('SSIDs'), for example for a guest network, is explained here. Up to 4 SSIDs can be made for each frequency. In total this amounts to 8 SSIDs on the eco-wifi 04AC (for the 2.4GHz and 5GHz frequencies).

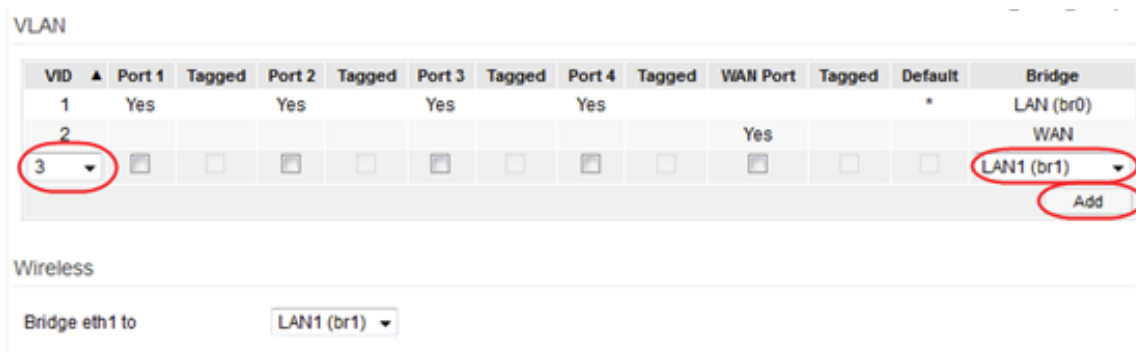
1. In the menu Basic > Network, add an extra 'bridge' with a unique IP-number (not equal to 192.168.4.1). Check DHCP. Click on Add, and next click on Save at the bottom of the page. In the figure below, **10.0.0.1** is created for the new bridge **1 (br1)**:



Bridge	STP	IP Address	Netmask	DHCP	IP Range (first/last)	Lease Time (mins)
br0	Disabled	192.168.200.1	255.255.255.0	Disabled		
1	<input type="checkbox"/>	10.0.0.1	255.255.255.0	<input checked="" type="checkbox"/>	10.0.0.2 10.0.0.254	1440

Click on Add, then on Save at the bottom of the page.

2. In the menu Advanced > VLAN: Under VLAN, add VLAN ID **3** and connect it to the new **LAN1 (br1)** bridge. Click on Add.



VID	Port 1	Tagged	Port 2	Tagged	Port 3	Tagged	Port 4	Tagged	WAN Port	Tagged	Default	Bridge
1	Yes		Yes		Yes		Yes				*	LAN (br0)
2	<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		Yes			WAN
3	<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>			LAN1 (br1)

3. Go to the menu Advanced --> Virtual Wireless. Set the wifi network name of the guest network under 'SSID'. On this page you can also set the security: on top of the page a block is shown with 'Overview'. In het the grey squares next to it, all the guest networks are listed. You can click on them, after which a page is displayed that allows you to set the security.

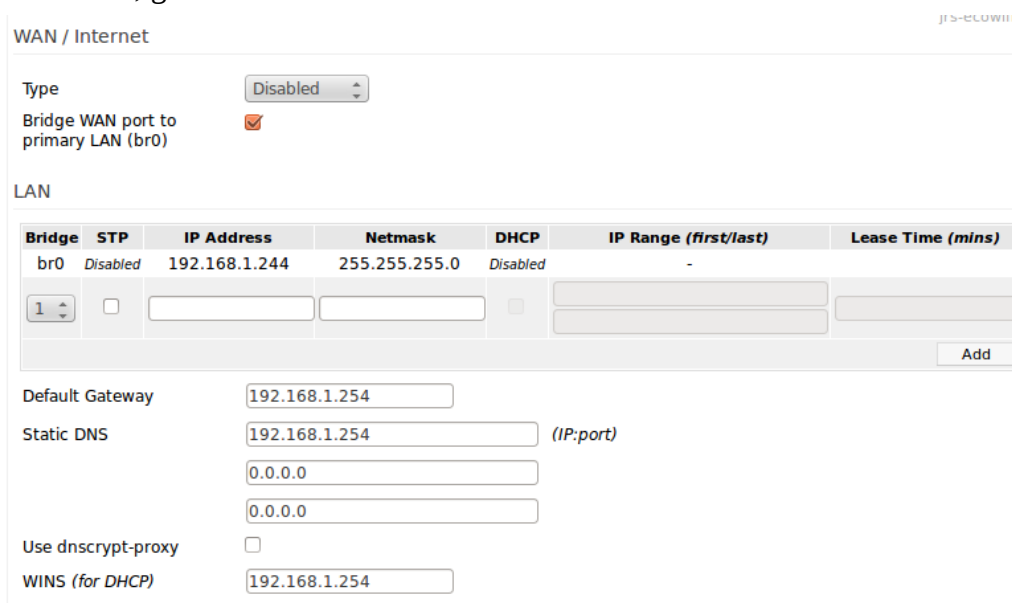
4. Reboot the router.

## Configure the eco-wifi as a switch instead of as a router

The eco-wifi can also be configured as a switch instead of as a router. This can be necessary for example in order to be able to reach a a Network Attached Storage device from devices

that are connected to your internet modem (which is on the WAN side of the eco-wifi), or for seamless roaming of wireless devices between multiple eco-wifi routers. In the latter case, you also need to set the SSIDs and wireless passwords exactly the same for all routers.

1. Go to the eco-wifi menu Status → Overview and write down the 4 number address that is listed next to *Gateway*, which is the IP address of your internet modem. Also write down the 4 numbers that are listed next to *Subnet*. These numbers are needed in the next step.
2. In the eco-wifi, go to the menu Basic --> Network.



The screenshot shows the 'WAN / Internet' configuration page. The 'Type' is set to 'Disabled'. The 'Bridge WAN port to primary LAN (br0)' checkbox is checked. Under the 'LAN' section, there is a table with columns: Bridge, STP, IP Address, Netmask, DHCP, IP Range (first/last), and Lease Time (mins). The first row shows 'br0', 'Disabled', '192.168.1.244', '255.255.255.0', 'Disabled', and '-'. Below the table, there are input fields for 'Default Gateway' (192.168.1.254), 'Static DNS' (192.168.1.254), and 'WINS (for DHCP)' (192.168.1.254). There are also empty input fields for 'Static DNS' (0.0.0.0) and 'Use dnscrypt-proxy' (unchecked).

- Under *IP Address* (in the field with the number 192.168.1.244 in the example figure) fill in the first 3 numbers of your internet modem's IP address found in step 1 and choose as the 4th number an unused number in your network (a safe choice is usually between 80 and 239).
- Under *Netmask* (in the field with the number 255.255.255.0 in the example figure) fill in the 4 numbers found in step 1 at *Subnet*. Uncheck *DHCP*. Click on OK (right).
- Next to *Default Gateway*, *Static DNS* and *WINS* (in the fields with the number 192.168.1.254 in the example figure), fill in the full 4-number IP address of your internet modem found in step 1.

3. Click on save (at the bottom of the page).
4. Note: from now on, the settings menu of the eco-wifi can be reached by typing in Internet Explorer the new IP number that you have chosen in step 2.

## Full reset of the eco-wifi

To reset the router, so that all passwords, settings etc. are returned to default values, use the following procedure. All eco functionality will remain after the reset.

1. Pull the power plug out of the outlet.
2. Push the WPS-button and keep it pressed.
3. Put the power plug in the outlet. The blue power light should be blinking rapidly now.
4. Keep the WPS-button pressed for another 3 seconds.

After resetting:

Eco-wifi 04AC: follow the procedure to activate the 5GHz network described below.

## Troubleshooting

### If you cannot connect to the wireless network

- There could be a problem with the settings on your wifi device (laptop/mobile phone), for example the wrong type of security setting has been selected or the wrong password has been typed in. Try to use 'forget network' or similar so that you can enter the settings/password again.
- Try to change the wireless channel in the menu Basic --> Settings.
- In very exceptional cases, for example very old computers - this concerns 1% of cases - the reduced pulsing of the eco-wifi may not be compatible with your wireless device. A possible solution is to use a USB wifi adapter stick in your wireless device to connect with the eco-wifi.

### Intermittent connection drops (periodic connection drops and reconnects)

- Change the channel in the menu basic -> network ('channel'). Click on 'scan' first to find a free channel. For the eco-wifi 04AC: do this both for the 2.4GHz channel and the 5GHz channel (is shown twice). Click on 'save'.
- Lower the 'beacon interval' to 800 in the menu Advanced --> Wireless. For the eco-wifi-04AC: do this both for the 2.4GHz channel and the 5GHz channel (is shown twice).

After changing the settings click on save at the bottom of the page.

### **For a slow connection (slow download or upload)**

– In the menu Advanced → Wireless, change the WMM® (wireless multimedia) setting to 'disabled' and click on save at the bottom of the page. Reason: this setting may disturb proper routing of data-packets in combination with certain types of internet modems.

– Optionally: in the menu Advanced → Wireless, change the Interference Mitigation setting to 'Non-WLAN' and click on save at the bottom of the page. This function attempts to avoid interference from other equipment that is transmitting on the same frequency (such as certain wireless video links).

### **If the 5GHz network is not showing on your wireless device**

– In the menu Advanced → Wireless, change the country setting for 5GHz to the correct value.

### **5GHz network LED on the eco-wifi 04AC**

– The status of the 5GHz network (on or off) is displayed on the eco-wifi 04AC with the **USB LED**. The '5GHz' LED is always on regardless of the status of the 5GHz network.

### **If the 5GHz network is non functional on the eco-wifi 04AC**

This may happen after a reset of the eco-wifi router. In this event, in the menu Basic → Network, the 5GHz radio is not shown and the USB LED is off. Solve as follows:

1. Turn of the eco-wifi, **leave off for 5 seconds** (important), then do a full reset as explained on page 7.
2. Wait approx. 90 sec. (until the router has fully finished booting).
3. Open the configuration page as explained on page 3. Then **before making any other settings** click 'reboot'.
4. Wait until the timer has fully expired.
5. Now the 5GHz radio should be functional again, and will remain functional after switching the router off and on again.
6. If the 5GHz radio is not functional yet, retry the above steps.