

c) **Authentication** – This is the security method which the access point is using for connections. Choose the desired security based on the present access point settings.

Note Use WPA2-PSK for the most secure connection. No security can be used to conserve battery power.

d) **Passphrase** – If the authentication is WPA2-PSK, then enter a passphrase here.

Note Spaces and special characters, e.g., < > ? " % \$ # / \ | ! : * are not allowed at this time.

e) **Default Key** – This is the password if authentication is WEP-128.

Note Spaces and special characters, e.g., < > ? " % \$ # / \ | ! : * are not allowed at this time.

f) **DHCP** – Check this option if the Transmitter will receive a Dynamic IP address from a DHCP server.

Note For initial configuration, it is recommended to use DHCP for assigning IP Address to the Transmitter. The IP address can be made STATIC from the Virtual Coordinator after the Transmitter starts communicating with it.

g) **IP Address** – Assign a STATIC IP address.

h) **Netmask** – Assign a subnet mask associated with the STATIC IP address.

i) **Gateway Address** – This could be the IP address of your access point or wireless router which the Transmitter is associating with.

j) **Virtual Coordinator IP** – Assign the IP address of the PC on which the VC is installed.

k) **Communication Protocol** – This is the protocol used to communicate with the VC. Either TCP or UDP protocol can be selected. UDP is default and uses less battery power.

l) **Virtual Coordinator Port** – Readings from the sensor (Transmitter) are sent to the VC using this port number. Use the default UDP protocol and port **50002** unless this port is already used on the VC. If TCP protocol is used change this port number to 50006.

m) **Update Period** – Enter the Transmitter's reading transmission frequency in seconds.

n) **Save and Reboot** – Click "Save Changes". Verify the settings and then click "Reboot". The webpage should say that the Transmitter is rebooted.

If your Transmitter has a display, you should now be able to see the sensor readings on the display.

Note The Transmitter stays in AD-HOC mode for a few minutes and then goes to sleep to conserve battery. So the step to put the device into AD-HOC mode and to configure it using a web page needs to be done together.

Also during this time, it is recommended to set the "Update Period" to the default (10 seconds). Once the Transmitter and the VC are communicating properly, the "Update Period" can be changed to the desired value.

3.6. Getting the Readings

If the PC used to configure the Transmitter is the same as the one running the VC, then change its IP address to the STATIC IP address set for the VC. Start a new browser and enter **http://<IP address of virtual coordinator>**

If using a different PC, go to the PC running VC. Open up a web browser and enter **http://<IP address of virtual coordinator>**

Click the button that says readings. Enter the user name as "user" and the password as "12345678". You should be able to see the readings.

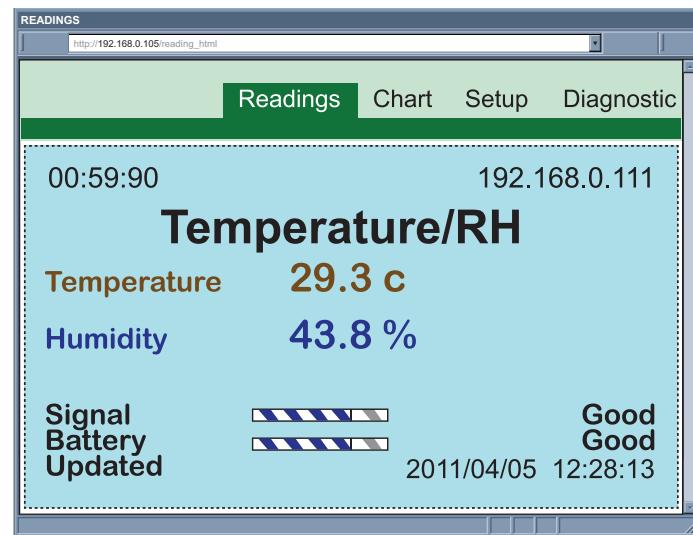


Figure 7

TROUBLESHOOTING

Once you apply the steps described above, if you still cannot see the Transmitter on your VC check the following items:

- Blue LED** – The Blue LED on the Transmitter blinks every time it transmits data. If the Blue LED is solid on it then means that it's trying to connect and transmit data to the access point with no success.
- Java Runtime Environment (JRE)** – Make sure that the Java Runtime Environment (JRE) is running on the PC on which the VC is installed. If the Java Runtime is not installed on the computer the VC will not display readings from the Transmitters. Should be 32-bit Java version 1.6 or higher.
- Wireless Connection** – If you plan to connect on a wireless LAN make sure that the wireless connection on your computer on which the VC is installed is linked to the correct access point. You may want to connect to the same access point to which the Transmitter is connected. You can verify that by looking at the Wireless Connection Manager on your computer.
- Wired LAN** – If your computer is on a wired LAN on which the correct access point is also connected, make sure that you can reach the access point from your computer. This can be accomplished by "pinging" the IP address of the access point.
- Firewall** – Make sure that the firewall is off or the exceptions are added properly.
- Back to AD-HOC Mode** – If you cannot find anything wrong with your computer wireless connection and the access point, then there is a chance that the Transmitter was not configured correctly. To reconfigure the Transmitter you must put the Transmitter back into the AD-HOC mode. To do this, open the case, slide the red Power button to the OFF position. Next, press and hold the white Default button, slide the red Power switch back to the ON position, and release the white button once the blue LED comes up solid. You can now follow from **Step 3.4** of the Transmitter's Initial Configuration section.
- Access Point/Wireless Router** – In general, the latest/newest access Points are better than older ones. Also, check to see if your access point has the latest firmware installed.

WARNING: These products are not designed for use in, and should not be used for, patient-connected applications. This device is marked with the international caution symbol. It is important to read the Setup Guide before installing or commissioning this device, as the guide contains important information relating to safety and EMC.

It is the policy of NEWPORT to comply with all worldwide safety and EMC/EMI regulations that apply. NEWPORT is constantly pursuing certification of its products to the European New Approach Directives. NEWPORT will add the CE mark to every appropriate device upon certification. The information contained in this document is believed to be correct, but NEWPORT Electronics, Inc. accepts no liability for any errors it contains, and reserves the right to alter specifications without notice.

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SPECIFICATION

SENSOR SPECIFICATIONS

RELATIVE HUMIDITY (wTHP, wTHP2, wBTHP)

Accuracy/Range:

±2% for 10 to 90%
±3% for 5 to 10% and 90 to 95%
±4% for 0 to 5% and 95 to 100%
Hysteresis: ±1% RH
Non-linearity: ±3%
Repeatability: ±0.1%
Resolution: 0.1%

TEMPERATURE (wTHP, wTHP2)

Accuracy/Range:

±0.5°C for 5 to 45°C (±0.9°F for 41 to 113°F);
up to ±1.5°C for -40 to 5°C and 45 to 124°C
(up to ±2.7°F for -40 to 41°F and 113 to 255°F)

TEMPERATURE (wTP1, wTP2)

Accuracy/Range:

±0.5°C for 10 to 85°C (±0.9°F for 50 to 185°F);
±1°C for -40 to 10°C and 85 to 125°C
(±1.8°F for -40 to 50°F and 185 to 257°F)

TEMPERATURE (wBTHP)

Accuracy/Range:

±0.5°C for 5 to 45°C (±0.9°F for 41 to 113°F);
up to ±1.5°C for -40 to 5°C and 45 to 85°C
(up to ±2.7°F for -40 to 41°F and 113 to 185°F)

TEMPERATURE (wBTP)

Accuracy/Range:

±0.8°C @ 25°C (±1.5°F @ 77°F)
±4°C for -40 to 85°C (±7.2°F for -40 to 185°F)

*NOTE: extended temp range is for Probe only, the Controller's operating temp is -10 to 55°C

Resolution: 0.1°C

BAROMETRIC PRESSURE (wBTP, wBTHP)

Accuracy/Range:

±2 mbar for 300 to 1100 mbar @ 0 to 50°C
±6 mbar for 300 to 1100 mbar @ -40 to 85°C
Resolution: 0.1 mbar

ANALOG VOLTAGE & CURRENT INPUT (wVI)

Voltage Input:

Differential; bipolar; ±100 mV, ±1 V, ±10 V

Input Impedance: 38 K ohm for voltage

Current Input:

Differential; bipolar; ±20 mA (5 ohm load)

Accuracy: ±0.1% Full Range @ 25°C

Reading Rate: Periodic (1 sample/update) or continuous (3 samples/second)

Resolution: 16 bits

THERMOCOUPLE INPUT (wTC)

Thermocouple Type (ITS 90):

J, K, T, E, R, S, B, C, N, L

Reading Rate: Periodic (1 sample/update) or continuous (3 samples/second)

METER SPECIFICATIONS

Supported Protocols (Transmitter): TCP/IP, UDP, ARP, ICMP, DHCP, HTTP and FTP

Supported Protocols (VC): TCP/IP, UDP, HTTP, FTP, SMTP and Telnet

WIRELESS COMMUNICATION

Standard: IEEE 802.11 b/g

Frequency: 2.4 GHz (2402-2483.5 MHz)

Range: Up to 60m (200ft) indoor line-of-site or more depending upon sensitivity, data rate, wireless access point and environmental considerations

Radio Power Output Level (Class 1):

91.4 mW EIRP (19.6 dBm EIRP)

Modulation:

802.11b compatibility: DSSS (CCK-11, CCK-5.5, DQPSK-2, DBPSK-1);

802.11g: OFDM (default)

Channels: 1-13; Channel 14 for Japan use only and is not certified.

Channel Spacing (Bandwidth): 20 MHz

Transmission Rate (Over the air):

1-11 Mbps for 802.11b / 6-54 Mbps for 802.11g

POWER

Power Input: 5 Vdc or 9 Vdc (wVI only)

Consumption: 0.7W max or 1.3W max (wVI only)

Safety Qualified ac Power Adapter (included):

Nominal Output:

5 Vdc @ 0.6 A or 9 Vdc @ 0.5 A (wVI only)

Input: 100 to 240 Vac, 50/60 Hz

Back-up Alkaline Battery:

One AA 1.5 Vdc, supplied

POWER (wSeries-CCELL)

Alkaline Battery:

Two C-CELL 1.5 Vdc, supplied

Lifetime: Estimate of 2.4 years (wTC/wVI) and 4.3 years (wTxP/wBxP) with frequency of 1 reading per 1 minute

Dimensions:

96.5H x 146.3W x 50.8D mm (3.8 x 5.76 x 2"), not including connectors or antenna

Operating Temperature:

-10 to 55°C (14 to 131°F), 90% RH non-condensing

AC Power Adapter: 0 to 40°C (32 to 104°F)

WARRANTY/DISCLAIMER

NEWPORT Electronics, Inc. warrants this unit to be free of defects in materials and workmanship for a period of one (1) year from the date of purchase. In addition to NEWPORT's standard warranty period, NEWPORT Electronics will extend the warranty period for one (1) additional year if the warranty card enclosed with each instrument is returned to NEWPORT.

If the unit malfunctions, it must be returned to the factory for evaluation. NEWPORT's Customer Service Department will issue an Authorized Return (AR) number immediately upon phone or written request. Upon examination by NEWPORT, if the unit is found to be defective, it will be repaired or replaced at no charge. NEWPORT's WARRANTY does not apply to defects resulting from any action of the purchaser, including but not limited to mishandling, improper interfacing, operation outside of design limits, improper repair, or unauthorized modification. This WARRANTY is VOID if the unit shows evidence of having been tampered with or shows evidence of having been damaged as a result of excessive corrosion, or current, heat, moisture or vibration; improper specification; misapplication; misuse or other operating conditions outside of NEWPORT's control. Components which wear are not warranted, including but not limited to contact points, fuses, and traces.

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The purchaser is responsible for shipping charges, freight, insurance and proper packaging to prevent breakage in transit.

FOR WARRANTY RETURNS, please consult NEWPORT for current repair BEFORE contacting NEWPORT:

- Purchase Order number under which the product was PURCHASED,
- Model and serial number of the product under warranty, and
- Repair instructions and/or specific problems relative to the product.

FOR NON-WARRANTY REPAIRS, have the following information available BEFORE contacting NEWPORT:

- Purchase Order number to cover the COST the repair,
- Model and serial number of product, and
- Repair instructions and/or specific problems relative to the product.

NEWPORT's policy is to make running changes, not model changes, whenever an improvement is possible. This affords our customers the latest in technology and engineering.

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Wi-Fi
Wireless Sensor System
802.11b/g Wireless Ethernet



wSeries **Wireless Transmitter**

For immediate technical or application assistance please call:

1-800-6397678®
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Newport Electronics, Inc.
2229 South Yale Street • Santa Ana, CA • 92704 • U.S.A.
TEL: (714) 540-4914 • FAX: (203) 968-7311
Toll Free: 1-800-639-7678 • www.newportUS.com • e-mail: info@newportUS.com
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Newport Technologies, Inc.
976 Bergar • Laval (Quebec) • H7L 5A1 • Canada
TEL: (514) 335-3183 • FAX: (514) 856-6886
Toll Free: 1-800-639-7678 • www.newport.ca • e-mail: info@newport.ca

Newport Electronics, Ltd.
One Omega Drive • River Bend Technology Centre
Northbank, Irlam • Manchester M44 5BD • United Kingdom
Tel: +44 161 777 6611 • FAX: +44 161 777 6622
Toll Free: 0800 488 488 • www.newportuk.co.uk • e-mail: sales@newportuk.co.uk

Newport Electronics B.V. - Benelux
Managed by the United Kingdom Office
TEL: +31 20 3472121 • FAX: +31 20 6434643
Toll Free: 0800 0993344 • www.newport.nl • e-mail: info@newport.nl

Newport Electronics spol s.r.o.
Frystatska 184, 733 01 Karviná • Czech Republic
TEL: +420 59 6311899 • FAX: +420 59 6311114
Toll Free: 0800-1-66342 • www.newport.cz • e-mail: info@newport.cz

Newport Electronics GmbH
Daimlerstrasse 26 • D-75392 Deckenpfronn • Germany
TEL: 49 7056 9398-0 • FAX: 49 7056 9398-29
Toll Free: 0800 / 6397678 • www.newport.de • e-mail: sales@newport.de

Newport Electronique S.A.R.L. - France
Managed by the United Kingdom Office
TEL: +33 1 61 37 29 00 • FAX: +33 1 30 57 54 27
Toll Free: 0800 466 342 • www.newport.fr • e-mail: sales@newport.fr

Mexico and Latin America
FAX: 001 (203) 359-7807
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NEWPORT Electronics, Inc.



This Quick Start Reference provides information on setting up your instrument for basic operation. The latest wSeries manual can be found at www.newportUS.com/manuals and the latest software, including the "Virtual Coordinator" can be found at www.newportUS.com/software

BEFORE YOU BEGIN

Parts Included:

- Transmitter
- Antenna
- Batteries and/or AC adapter
- Sensor (for models with an included digital sensor)
- CD with Virtual Coordinator Software, check our website for latest version.

Hardware/System Requirements:

You will need a computer, tablet, or smart phone that has Wi-Fi infrastructure and is Ad hoc capable. System Requirements: Windows XP, Vista, Windows 7 32/64-bit, Windows Server 2008 32/64-bit, Java 32-bit version 1.6 and above, Processor: 1GHz, RAM: 2GB, Browser: IE9 or Mozilla Firefox

Access Point/Wireless Connection:

You will need an Access Point / Wireless Router.

You will need the following information to ensure your device works correctly:

- Wireless Access Point SSID
- Passphrase/Security Settings
- IP Address (for transmitter)
- Netmask
- Gateway Address
- IP Address of computer that will run the "Virtual Coordinator" service.

OVERVIEW

wSeries wireless Transmitters take readings from the attached sensors, and transmit data on a wireless Ethernet 802.11b/g network commonly referred to as "Wi-Fi." These Transmitters are not "stand-alone" devices, they transmit data to the Virtual Coordinator.

The wSeries wireless sensor system provides Web-based monitoring of Analog Current and Voltage, Temperature, Humidity, and Barometric Pressure.

As with all Wi-Fi devices, the wSeries "Transmitters" are assigned unique IP addresses and connect to the LAN through a Wireless Access Point/Router.

To conserve battery power, the Transmitters wake up, take readings, transmit data and quickly go back to sleep. The user can select the frequency of transmissions. Less frequent transmissions result in longer battery life. In applications where battery life is not an issue, the wSeries device can transmit continuously, up to three sensor readings per second.

The wireless transmitter mount discretely on the wall in clean rooms, laboratories, museums, computer server rooms, warehouses, and any remote facility.

THE VIRTUAL COORDINATOR "VC" WEB SERVER

The "Virtual Coordinator" is a data logging software application running on a Windows or Linux computer somewhere on the network. The "VC" logs/collects data from the wireless Transmitters.

The VC includes a Java-based Web server that can display readings, charts, and record data sent by the transmitters. The readings, data, and charts are viewed from a Web browser.

The browser [accessing](#) the VC Web server, can be the same computer on which the VC is installed-- or any other device with Web browsing capabilities on the local network or the Internet (a computer, tablet or smart phone).

For Windows PC's

The VC runs as a "Service" in the background, rather than a "Program". As long as the computer and its network connection is functioning correctly, the VC will collect data from the transmitters and serve it to Web browsing clients as requested. The VC can also provide data to popular Data Acquisition and Process Control programs running elsewhere on the network. Meanwhile, the computer running the VC server can be used for other tasks.

Chart scales are fully adjustable on the fly. For example, the chart can display one minute, one hour, one day, one week, one month or one year. Temperature and humidity can be charted across the full span (-40 to 125°C, and 0 to 100% RH) or within any narrow range such as (20 to 30°C).

The OPC Server software makes it easy to integrate the wSeries wireless sensor system with many popular Data Acquisition and Automation programs offered by Omega, Wonderware, iConics, Intellution, Rockwell Automation, and National Instruments, among others.

CONFIGURATION

1. Configuring the computer running Virtual Coordinator Software (VC)

1.1. Disable Power Safe Options:

The computer running VC software needs to be running continuously. To do that:

a) Go to Control Panel>System and Security>Power Options. Choose the Power Plan>Change Plan Settings>Change Advanced Settings. Then choose the Hard Disk>Turn Off Hard Disk Option. Reduce this number from 20 to **0** (Never). Save the settings.

b) These settings may be different on Windows XP. Choose the Option to Never Turn Off Hard Disks and Never Put the System to Standby.

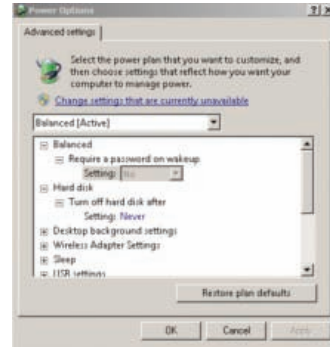


Figure 1

1.2. Java Runtime Environment:

This PC needs to have the latest Java Runtime Environment (JRE) installed. First check the JRE installed.

Go to Control Panel and look for the icon named Java. Clicking that will start the Java Control Panel. Go to the Java tab and click on View button.

Note the Version number. It should be something like 1.6.0.x. If the version number is anything less than 1.6 then go to www.java.com, download and install the latest version of JRE.

1.3. Firewall Exception:

This computer may have a firewall running which will block the readings sent from the sensor (transmitter) to the VC Software.

Configure the firewall to allow this data to go through. Refer to Appendix K and L in Operators Manual to configure the firewall.

1.4. IP Address:

If this computer is used to run the VC only and not to configure the Transmitter, then set a desired STATIC IP address.

If this PC is used for configuring the Transmitter then set up a STATIC IP address of **169.254.1.2** for now.

It is recommended to have the computer running VC hard-wired to the access point/wireless router.

For initial setup it is recommended to place the Transmitter and the VC close to the wireless access point/wireless router. Once the configuration is done the Transmitter can be mounted to the desired location.

This configuration applies to Windows PC. For Linux, visit our website or read the instructions in the CD.

One can also use a mobile device with a wireless (Wi-Fi) to configure the Transmitter.

2. Installing Virtual Coordinator Software

Find the setup.exe in the accompanying CD or on the web.

Double click that to install it.

The setup process is typical to any Windows program and asks you to choose the installation path and whether it is a new installation or an upgrade.

Now go to Start>All Programs>Newport>Virtual Coordinator Manager. Click on Install Services **twice** and wait until it prompts you to reboot the PC.

Reboot the PC to start all the services of Virtual Coordinator. Once the PC reboots, open up a web browser like Internet Explorer, type in <http://127.0.0.1> and a Virtual Coordinator web page should show up.

This means that the Virtual Coordinator web-server is running.

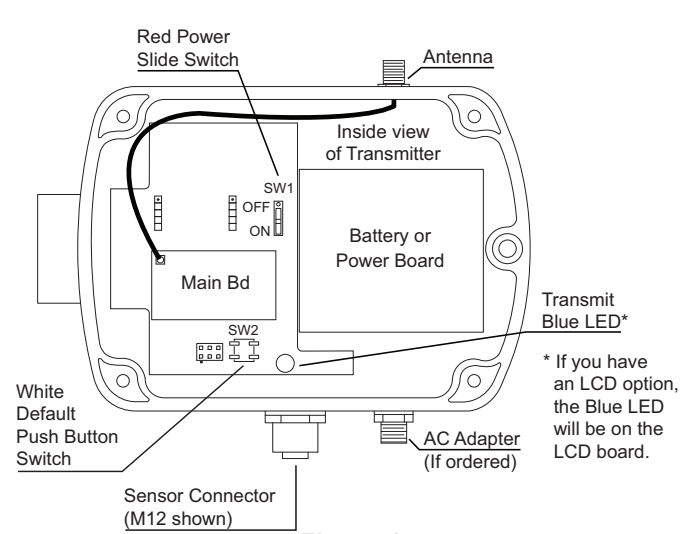


Figure 2

3. Configuring the Transmitters

Attach the antenna.

3.1. Connecting Sensors

Connect the sensors: digital probes, thermocouples, or analog inputs.

The digital probes for temperature, humidity, and barometric pressure use a NEMA 4, IP65 M12 connector.

Thermocouple wires and analog voltage & current wires thread through the NEMA 4, IP65 cable gland to the J1 terminals as shown in **Figure 3**.

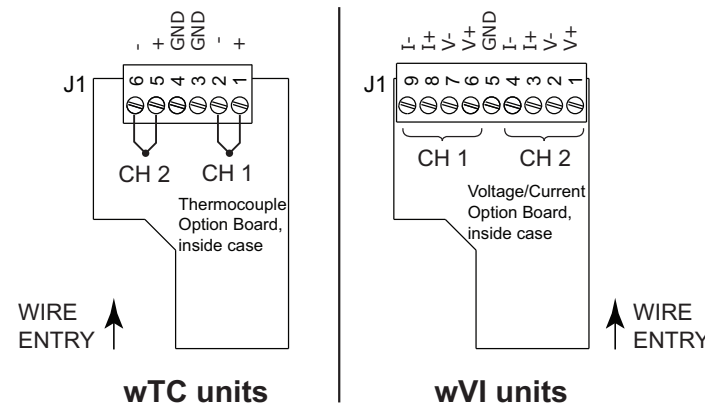


Figure 3

3.2. Battery Installation

Install batteries or connect the AC adapter (depending on model), you will need to open the transmitter's cover, refer to **Figure 2**.

3.3. Powering ON the Transmitter

IMPORTANT

The first time you power on the transmitter, you must follow this sequence or risk corrupting the firmware. If the firmware gets corrupted, the unit must be returned to the factory to have the firmware reinstalled.

- 6.1. Make sure the red power switch is OFF. See diagram in **Figure 2**.
- 6.2. Install two C-cell batteries, or connect AC adapter and install backup AA battery.
- 6.3. Press and hold white reset button (labeled "SW2").
- 6.4a. While continuing to press the white reset button, slide the red power switch ("SW1") to ON.
- 6.4b. Do not release the white reset button until the blue LED comes on solid (not blinking).
- 6.5. The transmitter is now in AD-HOC mode for initial wireless configuration.

3.4. AD-HOC Mode

While in AD-HOC mode, Transmitters with an LCD display will show the last 4 characters of its Mac address (part of SSID) on the display.



Figure 4

3.5. Finding the Transmitter

For the ad-hoc to synch with the PC usually takes 2-3 minutes after the Transmitter is powered ON. Check the Wireless Networks on the PC or mobile device that is used to configure the Transmitter.

This configuration software for wireless networks will show a network TXABCD (ABCD are the last four characters in the MAC address of the Transmitter).

The Transmitter which is in AD-HOC mode is running this wireless network.

Connect to this network by double clicking it. Once connected it should show the status CONNECTED.

Start up a web browser and type in the IP address of <http://169.254.1.1> and you should see a webpage for Initial Configuration. Enter the settings here. Refer to **Figure 6**.

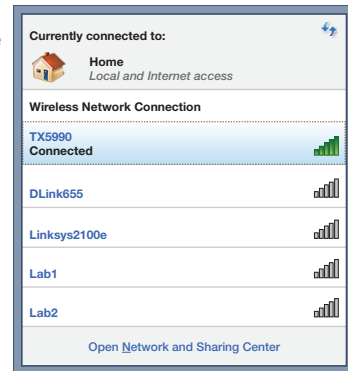


Figure 5

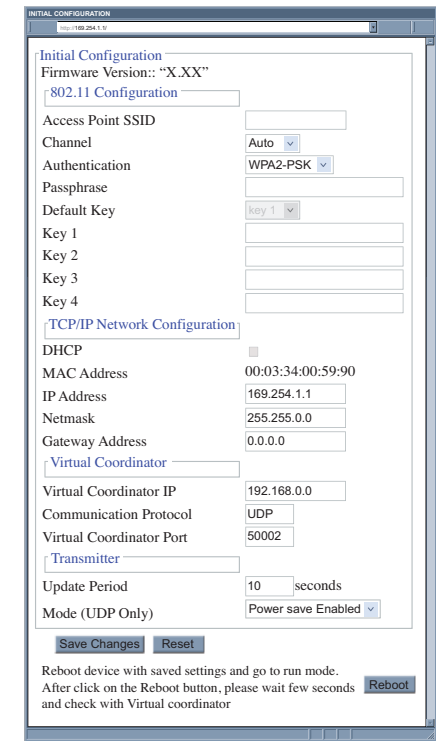


Figure 6

3.6. This is the only page in the Transmitter's Web server designed for important parameters needed to initially configure the Transmitter. Later, you will have a chance to make changes in the Transmitter through the VC if needed.

a) **Access Point SSID** – This is the name that the access point/wireless router is broadcasting on your Wi-Fi wireless network. In order for the Transmitter to associate itself with the access point, enter the access point's SSID.

Spaces and special characters, e.g., < > ? % \$ # / \ | ! : * are not allowed at this time.

b) **Channel** – This is the Wi-Fi channel on which the access point is accepts connections. If not sure what channel to use, simply select Auto.