Convert a Boonton 55 Series USB Sensor into an Ethernet-Connected Device by Using a Standard WiFi-USB Sharing Hub

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Abstract

Boonton's 55 Series Wideband USB Peak Power sensor can easily be used for remote monitoring within your local network via a LAN (PoE - Power-over-Ethernet) or WiFi connection by using a standard WiFi-to-USB sharing device. For network based instrument communications, a LAN or WiFi connection method can be the ideal choice for remote controlled RF power measurements within the same network environment. For a typical remote connection environment, a remote PC can be connected physically to a USB sensor and easily monitored remotely by other host PCs in different locations. This application note provides an alternate method to establish a connection with a remote 55 Series USB peak power sensor device without the requirement of a remote central PC. Once connected in this fashion, the remote sensor can be controlled and monitored by using Boonton's Peak Power Analyzer software or API installed in a host PC. For this connection method, it is typically necessary for all remote sensors and local PCs to be connected to the same local subnet. This connection method is ideal for various remote monitoring applications, such as EMI/EMC testing, particle accelerators, and satellite systems where sensors need to be placed at different locations within the same facility, but away from a host PC or Laptop. After connecting multiple sensors to a local network and by using an ordinary LAN/WiFi-to-USB sharing device, all connected 55 Series USB sensors can be remotely operated and monitored from a central location.

Typical Remote Monitoring via LAN and WLAN

By using a typical standard Ethernet-based or WiFi-based USB sharing device, and by installing a small Windows utility software on a host PC, it is possible to connect remotely and monitor multiple Boonton 55 Series USB sensors if all devices are connected to the same local subnet. Boonton Peak Power Analyzer software supports simultaneous operations of up to eight USB sensors. Therefore, it is possible to connect remotely to multiple sensors depending upon your USB sharing device's capability with available USB ports. Below is a typical remote control scenario for simultaneous monitoring of multiple USB sensor devices using a standard USB sharing hub in a local subnet of a LAN environment.

Note: Additional firewall configuration and some network protocol settings might be required if users wish to connect from outside the local subnet. Some organization's firewall policies may not allow operators to change their network settings.

Selecting the Right Accessories and Devices

In order to configure a wireless USB sharing device properly with the Boonton 55 Series USB Peak Power sensor, you will need to select the following devices and accessories:

• An Ethernet/WiFi-To-USB Sharing Device
• A Boonton 55 Series USB sensor with USB cable
• Installation software for USB sharing station
• Installation software of Boonton Peak Power Analyzer Suite
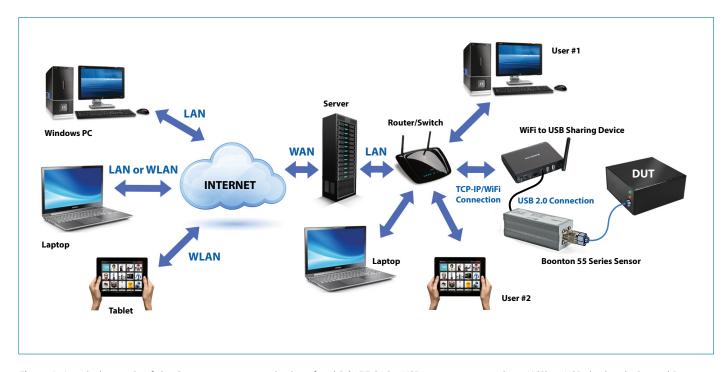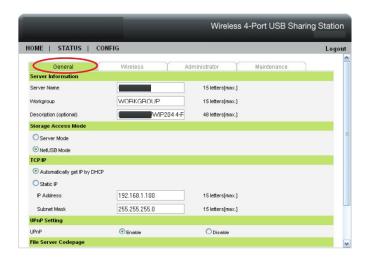• DUT connected to 55 Series sensor

Figure 1. A typical scenario of simultaneous remote monitoring of multiple 55 Series USB power sensors using a WiFi-to-USB sharing device and Boonton Peak Power Analyzer Software.

Configuring a USB Sharing device for Boonton 55 Series USB Sensor

The following test setup and connection procedure shows how easily one can convert a Boonton 55 Series USB sensor into a LAN or Wireless connection based measurement device. There are many USB sharing devices available in the market from different manufacturers. Each device might be different in configurations but should be similar for general-purpose use. In this example we used a typical USB Sharing device in a typical corporate network environment using both Ethernet and WLAN connection methods. Note that an USB sharing hub requires power via an external power supply or PoE from a connected wired switch/router.

1) Usually a CD comes with any standard USB sharing device to install driver files into a PC. Alternatively you may also download and install a related driver file from the manufacturer's website. Follow manufacturer's instructions while you are installing the driver.

2) Make sure you already have Boonton Peak Power Analyzer Suite installed on your PC or tablet. Before you are going to use a Wi-Fi-USB hub, verify that the 55 Series USB Power Sensor functions correctly with a direct USB connection to your PC.

3) Connect a Boonton 55 Series USB sensor to a USB port on the wireless USB Sharing Station. You can connect this USB Sharing device to any router or switch with an Ethernet cable or via WiFi if supported. Usually a LED turns on indicating that the unit is correctly connected to the network.

4) Some manufacturer's USB-Sharing devices allow configuration for both Ethernet and Wireless LAN connection. Usually a configuration option allows users to assign a fixed IP address to the USB Sharing Station or it can automatically get an IP address via DHCP (Recommended). Note that some USB sharing utility software might impose on subnet limitations.

Below are two example screenshots for both TCP/IP and wireless configurations:

Figure 2. IP address (DHCP or Static) configuration by using an Ethernet connection to the USB sharing hub
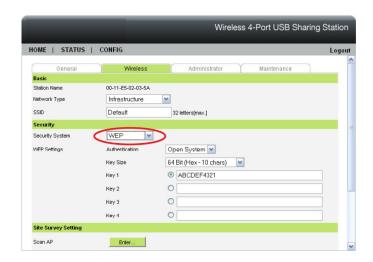

Figure 3. Wireless Settings of USB sharing device on a web based window

In order to verify your wireless connection with the device, you can unplug the Ethernet cable from the WiFi-USB hub and it will automatically connect to your wireless router. The WAN LED may or may not start blinking depending upon the model.

5) Once you are done with the TCP-IP or wireless configuration, the Windows based utility software for USB-sharing device will automatically search for connected USB devices and then will display its status. **Figure 4 (right)** is an example screenshot of that utility software showing a 55 Series USB sensor that is detected and available for remote connection.

6) Now you are ready to connect the attached remote 55 Series USB sensor to your local PC. From the utility software of the WiFi-USB hub, click on the device and select the ''Connect'' icon. Once connected, the sensor will appear on a virtual USB port on your local PC. **(Figure 5)**

7) You can also configure multiple USB sensors if your WiFi-USB hub has several USB ports. It is possible to connect multiple 55 Series sensors by using the utility software and the Boonton Peak Power Analyzer Suite. All connected USB sensors will be visible under the ''available resources'' window of the Boonton Peak Power Analyzer Suite main application.

8) Congratulations!! You are now ready to continue RF power measurement remotely by using Boonton Peak Power Analyzer Suite and attaching virtual com ports from a standard WiFi-USB hub.

Conclusion

Using a LAN or WiFi connection method, the Boonton 55 Series USB sensor offers flexibility for remote connectivity over a corporate network by using a standard Ethernet cable with a WiFi-to-USB sharing device. The USB power sensor can conveniently be controlled and monitored from a host PC running Boonton Peak Power Analyzer Suite within the same network environment. The use of a standard USB sharing hub is the ideal approach for remotely controlling USB devices over a local Ethernet connection or WLAN network environment without the necessity of a remote central PC.

Related Products

[1] Boonton 55 Series Peak Power Sensors
http://boonton.com/products/power-meters/55-series-wide-band-usb-power-sensor
[2] Resource Library (App Notes/White Papers)
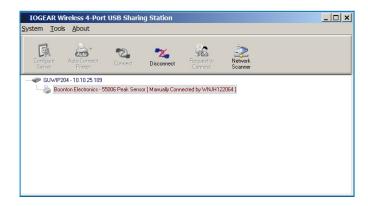http://boonton.com/resource-library?brand=Boonton&go=application_notes
[3] Real-Time Power Processing Techniques
http://www.boonton.com/real%20time%20power%20processing

Figure 4. Status of a WiFi-USB hub before Boonton USB sensor is selected and connected

Figure 5. Status of the utility software once USB sensor remote connection is established