# WatchHound-Pro Wireless Network Monitor

User Manual Version 1.3

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## Introduction

WatchHound-Pro scans all cellular, Wi-Fi (2.4 GHz and 5 GHz), Bluetooth and Bluetooth low energy as well as continuous wave 2.4 GHz and 5 GHz continuously for PEDs (Personal Electronic Devices) including cell phones, smart watches, tablets, computers, wireless headphones or earbuds, digital cameras and any wireless recording devices or bugs. The unit is designed to function with minimum interaction from any security personnel while scanning for wireless device usage that has been discouraged or prohibited from certain spaces. Spaces requiring wireless threat detection include government SCIFs (Sensitive Compartmented Information Facility), court rooms, visiting centers, military bases, law enforcement facilities, correctional centers, conference rooms, etc.

WatchHound-Pro is completely self-contained and requires no connection to any PC to fully function, but can be connected to a PC using its USB-C connection for firmware updates. The unit can be affixed to any wall or optional stanchion mount making it portable. WatchHound-Pro alerts are audible to all staff, visitors and security personnel making it a wireless threat detector and deterrent for everyone using an illegal or prohibited wireless devices in a secure area.

Once WatchHound-Pro detects wireless activity, the device (and possibly its user) must be located (using products such as Yorkie-Pro handheld wireless intrusion detector) and then determined to be a threat or not. If the device (and/or user) are deemed harmless, the device can be whitelisted using WatchHound-Pro's built in software so that it will not trigger any future alerts.

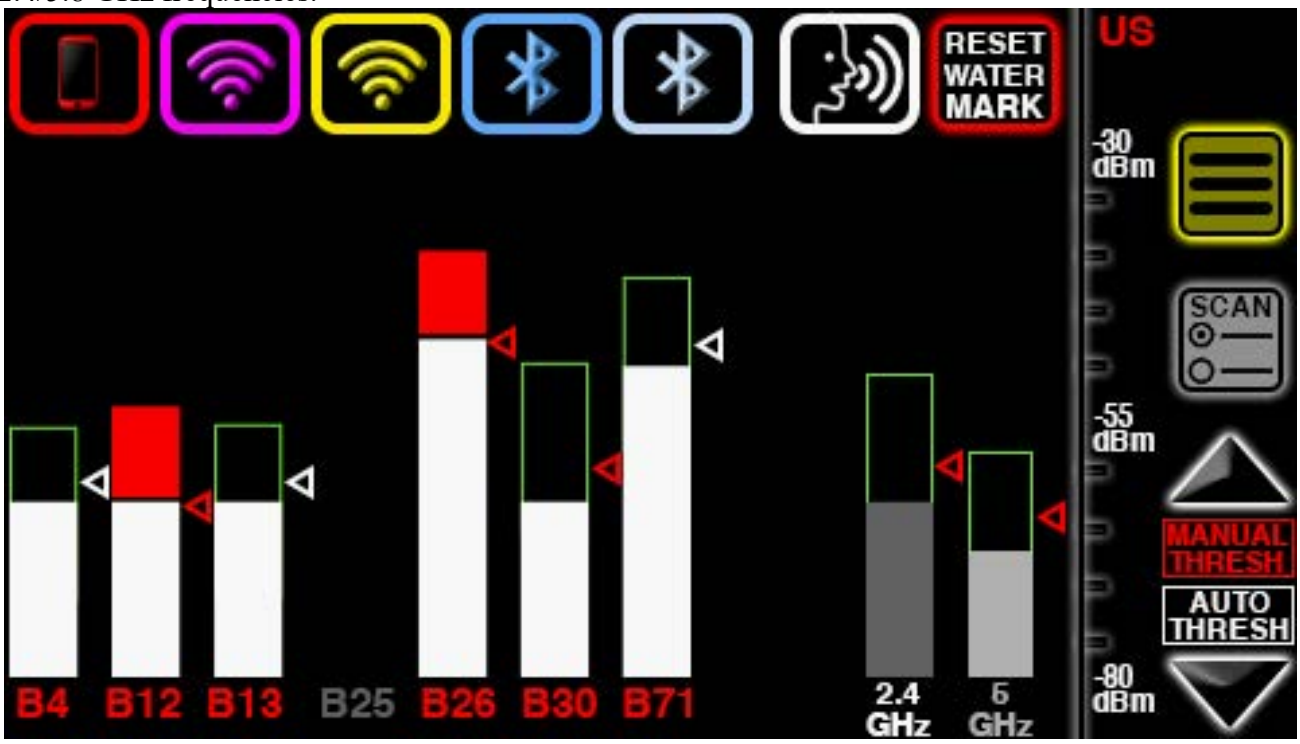
All parameters and adjustments are made from WatchHound-Pro's built-in touchscreen by designated security personnel including auto and manual thresholds, alert settings, international cellular bands and more.

## Unboxing

WatchHound-Pro unit ships with (3) omni-directional antennas, power supply and cable, ethernet cable and wall mounting accessories. Be sure to check under the accessories bag for mounting accessories.


The included omni-directional antennas (left to right) are tuned to 2.4 / 5.9 GHz, Wideband 650-3000 MHz and

2.4/5.8 GHz frequencies.




**Main Measurement Screen**

WatchHound-Pro Main Measurement screen allows control and monitoring over all CW wireless signals detected as well as alerts for demodulated devices. The buttons at the top flash when demodulated devices trigger alerts as well as navigate to those lists of detected devices.


Navigates to cellular phone screen


Navigates to list of 2.4 GHz Wi-Fi detected access points.


Navigates to list of 5 GHz Wi-Fi access points.


Navigates to list of Bluetooth detected devices.


Navigates to list of Bluetooth Low Energy (BLE) detected devices.


Toggles between audible voice alerts, audible siren alert or muted alerts with no audio at all.

Resets all watermarks (thin green line above the current signal strength detected).

Displays current country code of cellular bands being scanned. Touch this country code to see all cellular and Wi-Fi band designations that are currently being scanned.


Cellular band being actively scanned (red indicates active).


Cellular band not being actively scanned (grey indicates no scanning).


FirstNet band (orange B14 indicates public safety band)

Thin green watermark indicates strongest signal strength detected since last watermark reset.

Red bar indicates signal has surpassed the currently set threshold.

Manual threshold setting indicated by red color. Touch this indicator and once it blinks, it can be adjusted using the up/down threshold arrows only while the 'manual thresh' button blinks.

Auto threshold setting indicated by white color. Auto threshold can be toggled on and off by tapping the white 'auto thresh' button. If you have already manually adjusted any thresholds, you will probably see those white indicators automatically move into their auto threshold spots.


2.4 GHz continuous wave (CW) energy measurement. This measurement does not reflect any demodulated signals used in Bluetooth or Wi-Fi devices. 2.4 GHz CW can originate from cellular phones and also a variety of devices including wireless cameras, baby monitors and microwave ovens.


5 GHz continuous wave (CW) energy measurement. This measurement does not reflect any demodulated signals used in Bluetooth or Wi-Fi devices. 5 GHz CW can originate from cellular phones and also a variety of devices including wireless cameras, drones and baby monitors.

Navigates to main menu where users can fine tune a variety of alert and scan settings.

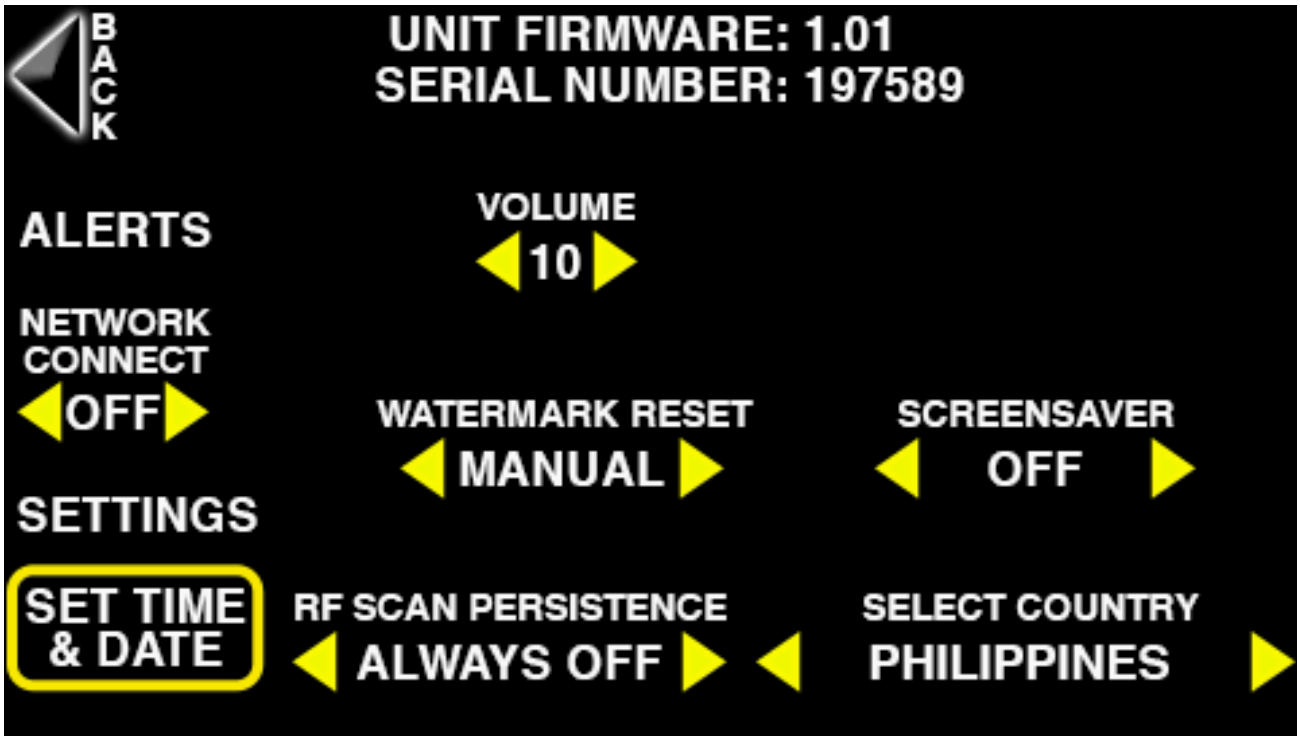

Suspends scanning of all cellular, Wi-Fi, bluetooth, BLE, 2.4 GHz CW and 5 GHz CW signals. Simply touch this button and then choose one or more buttons on the top to suspend scanning.

Raises the threshold manually for any blinking red indicators. This should decrease the amount of alerts triggered for those particular signals.


Toggles thresholds to be adjusted manually. This button will continue to blink while in manual mode allowing each signal's threshold to be manually adjusted.


Toggles thresholds into automatic mode allowing WatchHound-Pro to determine the noise floor and most reliable threshold settings by itself.

Lowers the threshold manually for any blinking red indicators. This should increase the amount of alerts triggered for those particular signals.




**Main Menu Options**

WatchHound-Pro Main Menu screen can be reached from nearly any other screen by touching the rectangular icon with three lines. This screen provides many adjustments as well as the unit's serial number and firmware.


Touch this button at any time in any screen to return to the previous screen.


Press the left or right yellow arrow to toggle the ethernet PoE network connection ON or OFF.


Press the left or right yellow arrow to adjust siren or voice alert volume on a scale from 1 to 10.

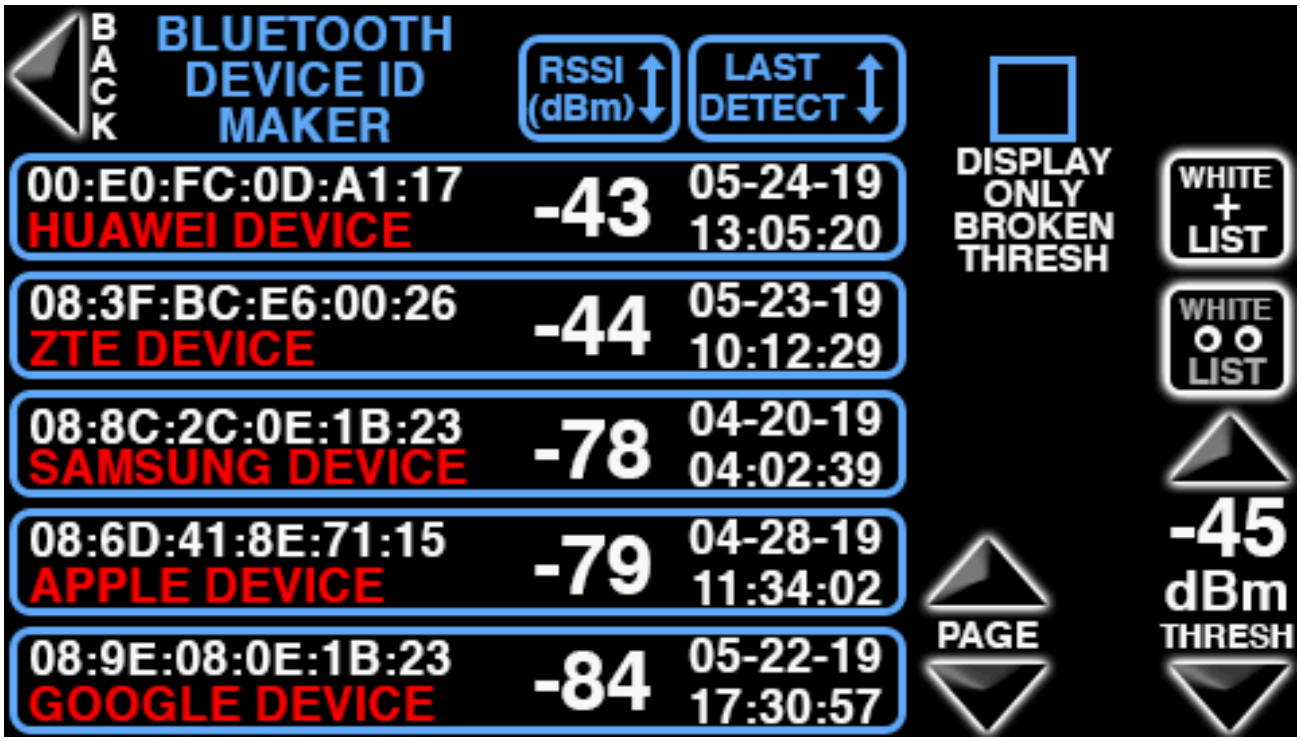

Choose between watermark reset choices: MANUAL, 5 SECS or 30 SECS. Selecting MANUAL allows users to view a profile of signals built up over time such as overnight when security personnel might not be present. The other two selections will simply erase the watermarks automatically after 5 seconds or 30 seconds.


Toggles between 3 different screensaver modes displayed on the touchscreen when the unit is not being actively used: OFF, STEALTH and CLOCK. OFF shows all RF activity measurements and no screensaver at all. STEALTH simply shows nothing, as if the unit is turned off entirely. CLOCK shows time, date and current temperature. The actual temperature is accurate and displayed in either Celsius or Fahrenheit degrees. The temperature sensor is mounted in the back of the unit shown here. Touch the BACK button to begin the screensaver of your choice and touch anywhere on the screen again to exit screensaver mode.


Set the time and date for both the screensaver clock mode and the timestamps of every measurement.


Change the rate at which Wi-Fi, BT, BLE measurements are displayed on their respective screens by choosing between 4 rates: always on, always off, 10 seconds and 10 minutes. These settings only affect the demodulated measurements. For example, only the last Wi-Fi scan result will be shown when it is set to always off. You might need to experiment with these settings depending upon environment. BVS recommends 10 seconds for busy RF environments and 10 minutes for less busy RF environments.


Change the country you are operating WatchHound-Pro within, thereby changing the cellular channels being scanned and displayed as well as international Wi-Fi bands. Choose between UNITED STATES, EUROPE, CANADA, AUSTRALIA, NEW ZEALAND, ISRAEL, INDIA, BRAZIL, SWEDEN, JAPAN, CHILE, PHILIPPINES, SOUTH KOREA, GUATEMALA, COSTA RICA and TRINIDAD. The country selected is also displayed on the MAIN MEASUREMENT screen according to its 2 letter country code in the upper right corner of the Main Measurement Screen.




**Demodulated Bluetooth Device Measurement Screen**

WatchHound-Pro can list all Wi-Fi 2.4 GHz, Wi-Fi 5 GHz, Bluetooth and Bluetooth low energy demodulated devices detected in their respective lists. Touching the blue BT icon on the main measurement screen lists all the BT demodulated devices detected. The screen shown above is only for Bluetooth devices, but the same descriptions and features apply to all types of demodulated devices.


Sort through all devices detected based upon their RSSI (Received Signal Strength Indicator) in dBm. Touch button to toggle between highest and lowest signal strength.


Sort through all devices detected based upon their timestamp of the last time that device was

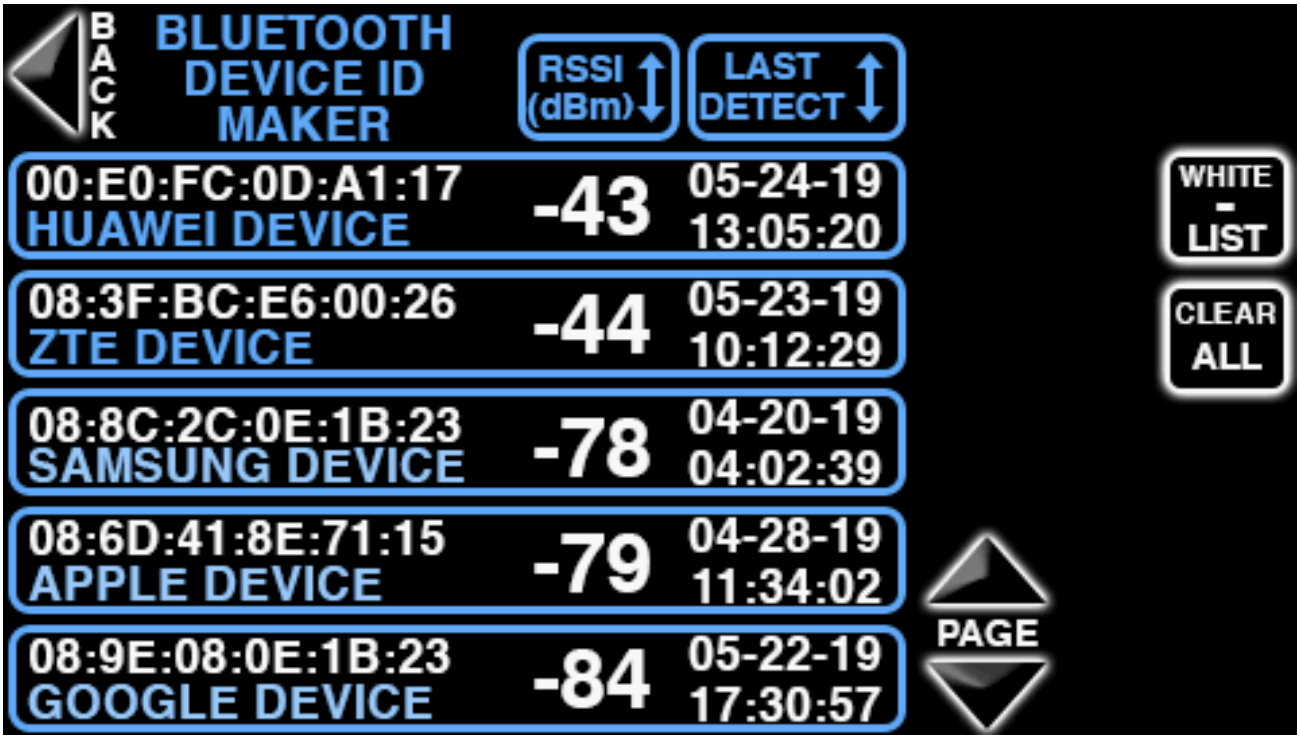

Each device detected includes MAC address, device name, RSSI in dBm and time stamp of last detection. Device names that appear in red have broken the threshold set by the user.


Scroll between multiple pages of devices detected.


Press this button to add devices into the whitelist of known, friendly devices. So long as this button blinks you may add devices one by one. Press this button again when you are finished adding to the whitelist.


Navigate to whitelist of known devices where you may delete devices from that list.


Set threshold for all demodulated devices in this list. Raising this threshold should decrease the amount of alerts triggered in this particular list. Lowering this threshold should increase the amount of alerts triggered in this particular list.




**Whitelist Measurement Screen**

This screen only displays devices that are currently whitelisted. From this list, whitelisted devices can be viewed, sorted and removed similar to the previous screen. The whitelist screen shown above only displays Bluetooth devices, but the same whitelisting features apply to all types of demodulated devices.


Sort through all devices detected based upon their RSSI (Received Signal Strength Indicator) in dBm. Touch button to toggle between highest and lowest signal strength.

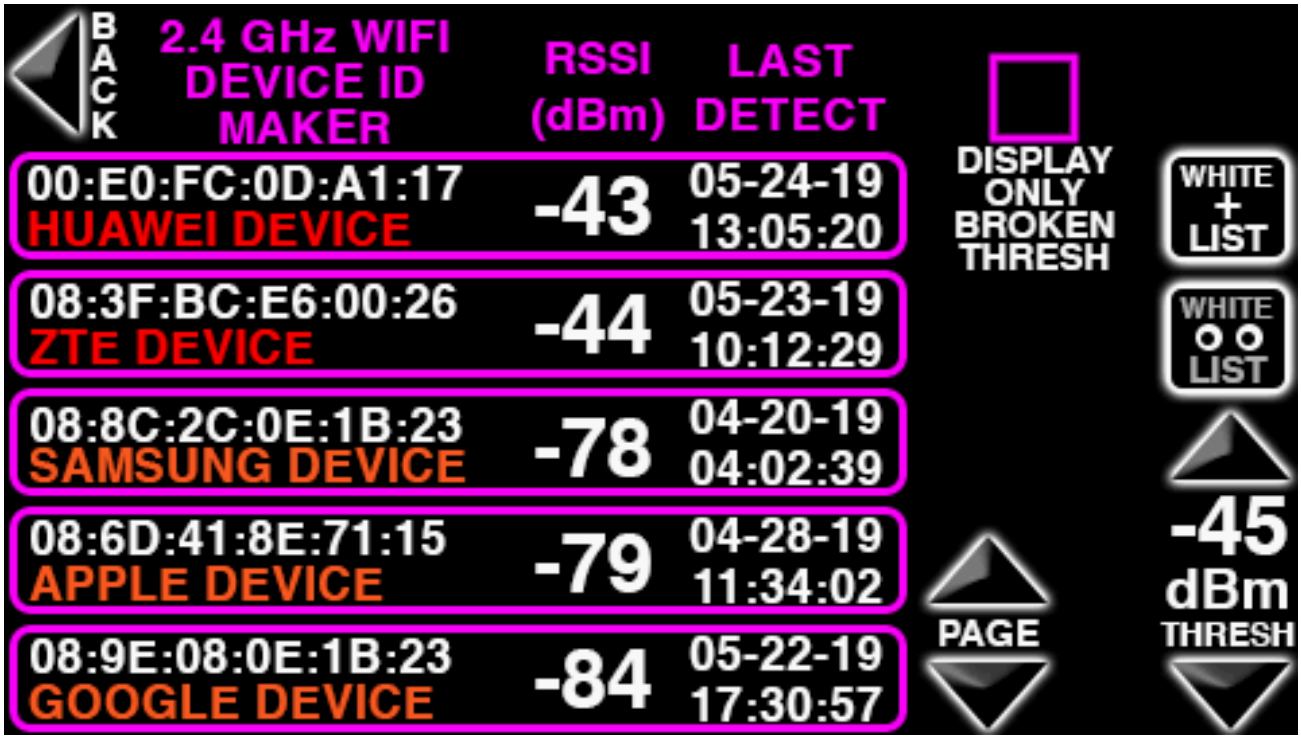

Sort through all devices detected based upon their latest timestamp


Each device detected includes MAC address, device name, RSSI in dBm and time stamp of last detection. Device names that appear in red have broken the threshold set by the user.


Scroll between multiple pages of devices detected.

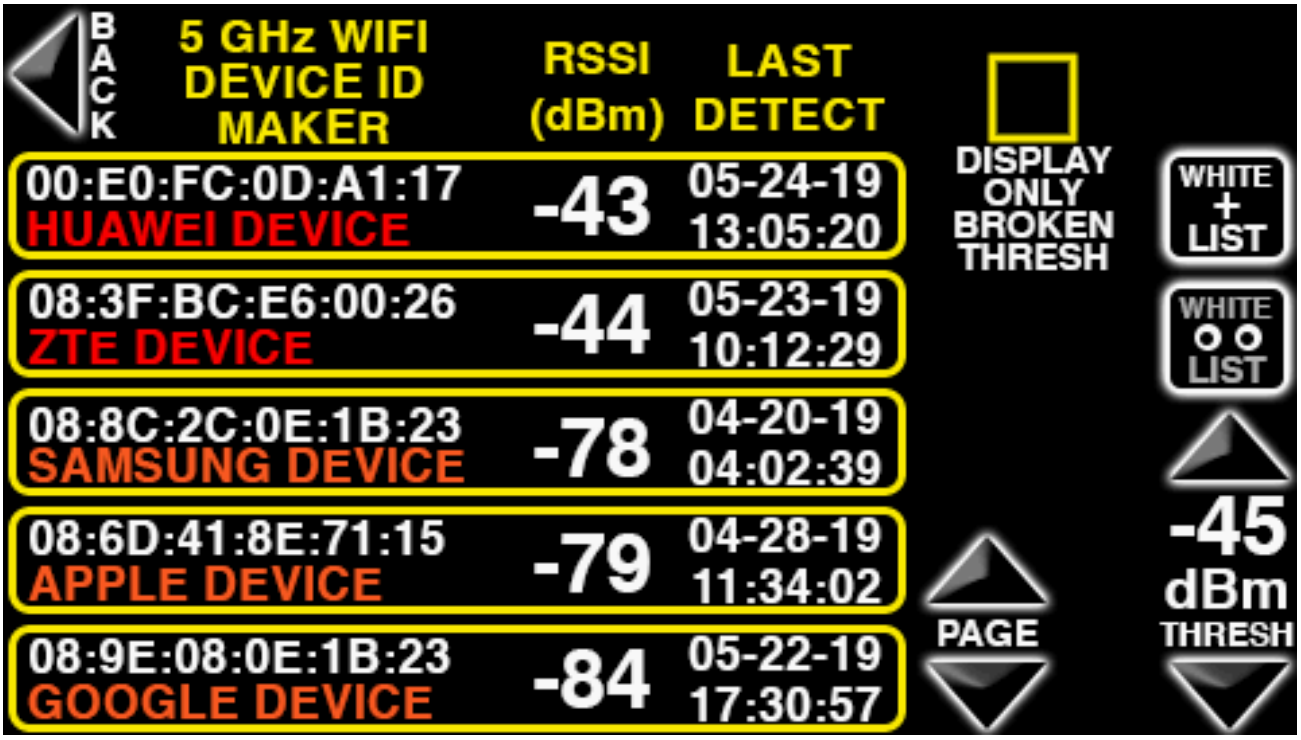

Remove whitelisted devices one by one from this whitelist and place them back into the Demodulated Device measurement list.


Remove all whitelisted devices at once from this whitelist and place them back into the Demodulated Device measurement list.



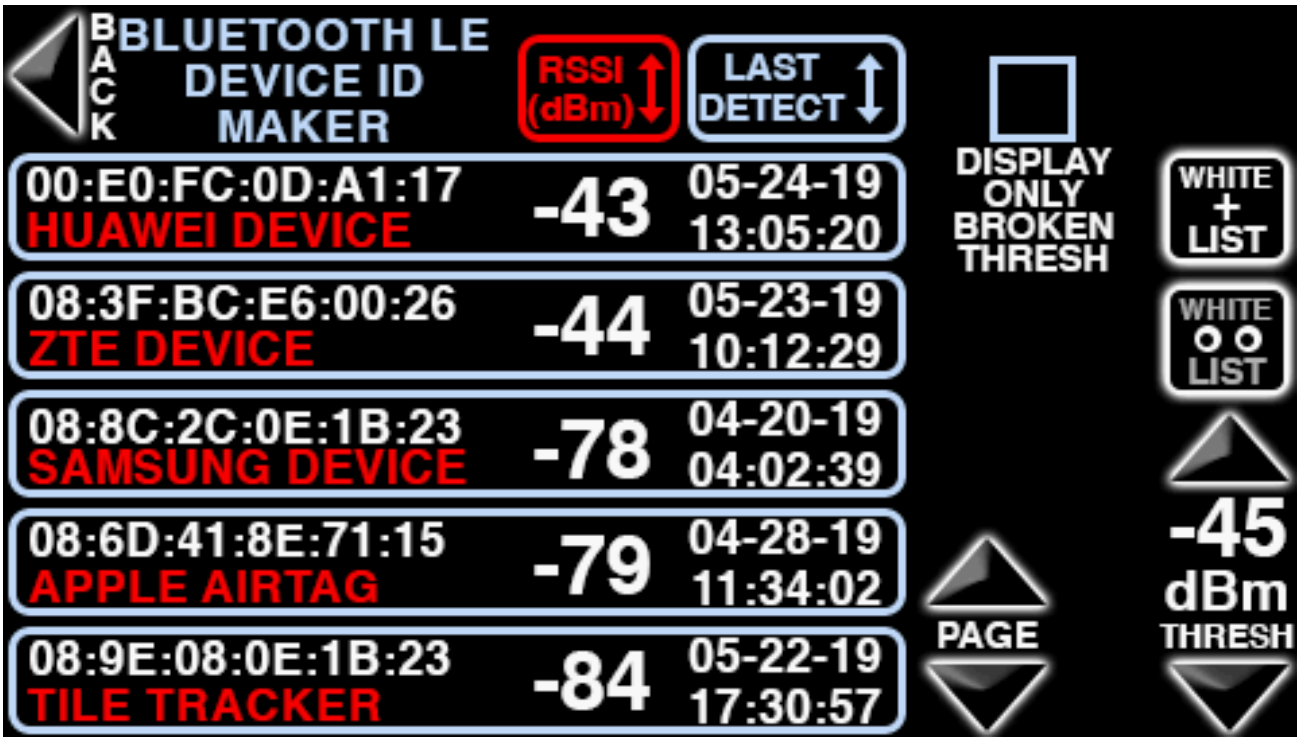

**2.4 GHz Demodulated Device Measurement Screen**

Touching the purple Wi-Fi icon on the main measurement screen lists all Wi-Fi 2.4 GHz demodulated devices detected. The screen shown above is only for Wi-Fi 2.4 GHz devices, but the same descriptions and features apply to all types of demodulated devices.




**5 GHz Demodulated Device Measurement Screen**

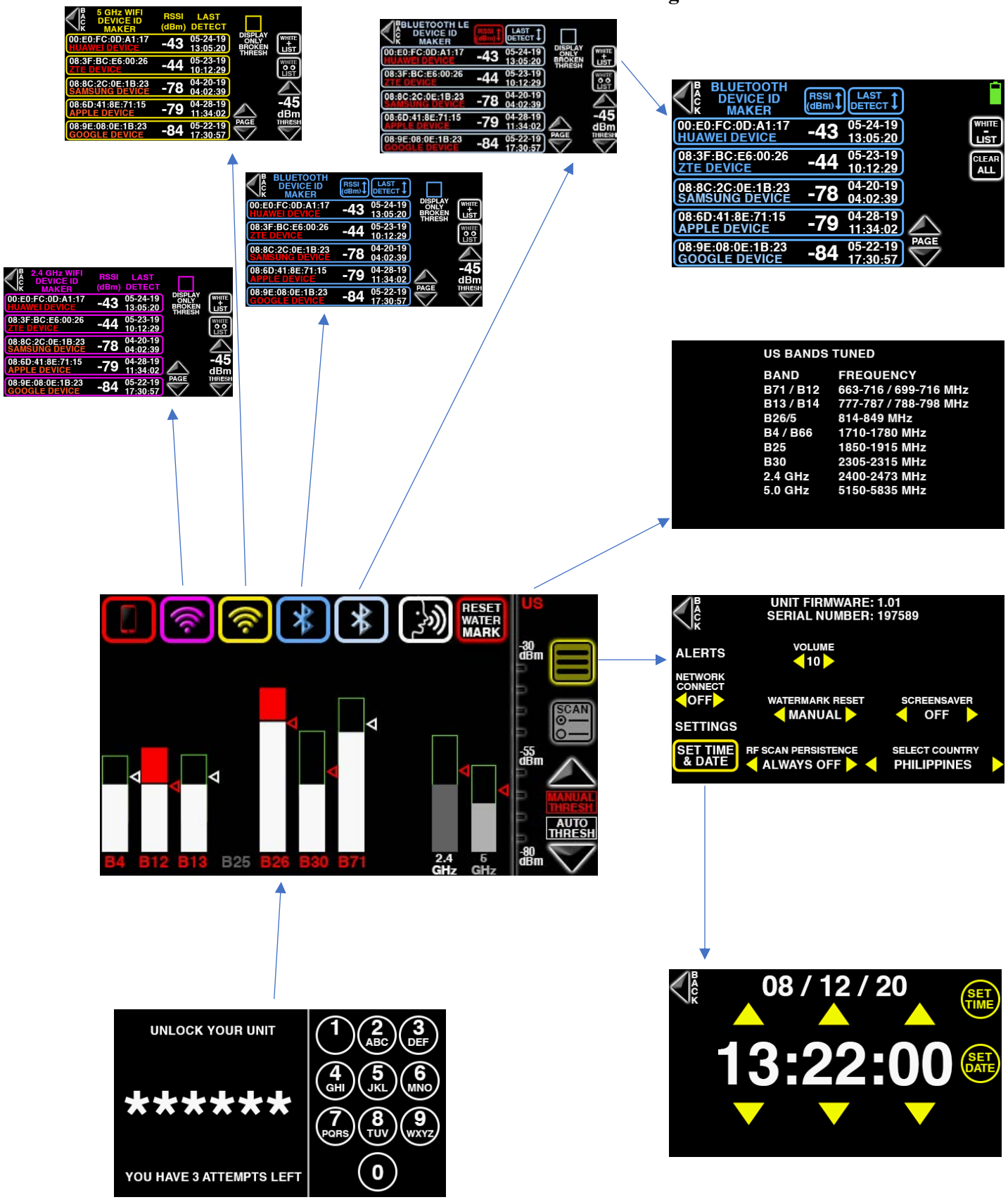
Touching the yellow Wi-Fi icon on the main measurement screen lists all Wi-Fi 5 GHz demodulated devices detected. The screen shown above is only for Wi-Fi 5.8 GHz devices, but the same descriptions and features apply to all types of demodulated devices.




**Demodulated Bluetooth Low Energy Device Measurement Screen**

Touching the light blue BLE icon on the main measurement screen lists all BLE demodulated devices detected. The screen shown above is only for BLE devices, but the same descriptions and features apply to all types of demodulated devices.

# WatchHound-Pro Screens Flow Diagram



**WatchHound-Pro Mounting Hardware**

WatchHound-Pro ships with everything you need to mount your unit onto most walls. You will need the following items: plastic mounting plates (included), drill for drilling into drywall, drill for screwing, bubble level, screws with wall spreaders (included).

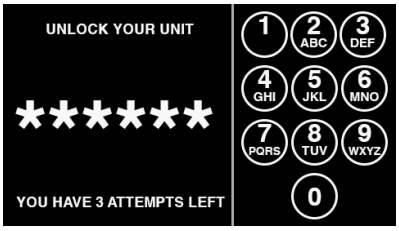
**Mounting Your WatchHound-Pro**

Before drilling any holes, make sure your mount is level. Next drill some pilot holes into the wall. Finally, insert the screws with drywall anchors into the wall and screw each corner of the mount.

## Charging

WatchHound-Pro can be powered in 2 different ways. The included 12VDC power allows the unit to operate anywhere. The ethernet PoE (Power over Ethernet) port allows the unit toi be powered over a network connection providing that the cable used is CAT5 or higher capacity.

## Security




WatchHound-Pro's touch screen requires a six digit PIN code in order to make any changes using the touchscreen even while the unit is physically unlocked. The PIN code is preset at the factory. If you lose your PIN code, contact BVS at 732-548-3737 or support@bvsystems.com.

## Dry Contacts

WatchHound-Pro includes dry contacts allowing users to connect external alarms and recording devices upon wireless detection. Contact your BVS sales or support representative for a complete list of supported devices that can be triggered by the dry contacts.

## Firmware Updates and Logging

WatchHound-Pro firmware can be updated via its USB-C port connected directly to a Windows PC.

**WatchHound-Pro Product Safety Info**

BVS WIDS (Wireless Intrusion Detection Systems) monitor for cellular, Wi-Fi and BT/BLE signals emitted by standard consumer electronic devices and therefore are rather passive Receivers of RF energy. Most of the time these receivers are passively listening for possible ambient signals of interest. Occasionally, BVS WIDS systems broadcast brief scanning requests. These requests are low energy standard signals just as signals emitted by personal consumer electronic devices, such as cell phones, etc.

Wi-Fi

Wi-Fi access points emit electromagnetic radiation in the form of radiofrequency (RF) signals to transmit data wirelessly. The RF signals used by Wi-Fi fall within the non-ionizing part of the electromagnetic spectrum, which means they do not have enough energy to ionize atoms or molecules and, therefore, are generally considered to be non-harmful at typical exposure levels.

The radiofrequency radiation emitted by Wi-Fi devices is classified as non-ionizing radiation, and it is generally considered safe for human exposure within established regulatory limits. Regulatory agencies, such as the Federal Communications Commission (FCC) in the United States, set limits on RF exposure to ensure that devices like Wi-Fi routers operate within safe levels.

Bluetooth & Bluetooth Low Energy

Similar to Wi-Fi, Bluetooth technology uses radiofrequency (RF) signals to transmit data wirelessly. Bluetooth operates in the same non-ionizing part of the electromagnetic spectrum as Wi-Fi, and the emitted radiation is generally considered to be safe at typical exposure levels.

Bluetooth devices, such as headphones, speakers, and other peripherals, emit low-power radiofrequency signals. The power levels used in Bluetooth communication are typically much lower than those associated with cell phones and other devices that use higher-powered RF signals.

As with any technology, it's important to follow established guidelines and regulations to ensure safe usage. Regulatory bodies, such as the Federal Communications Commission (FCC) in the United States, set limits on RF exposure to protect against potential health risks. The current scientific consensus is that the RF exposure from Bluetooth devices is not harmful at typical usage levels.

Cellphone

The radiofrequency (RF) signals emitted by cell phones are a form of non-ionizing electromagnetic radiation. The consensus among the scientific community, as reflected in the guidelines of various health organizations and regulatory agencies, is that the RF exposure from cell phones, when used within established safety limits, is not likely to cause harm to human health.

Regulatory bodies, such as the Federal Communications Commission (FCC) in the United States, set limits on the Specific Absorption Rate (SAR), which measures the rate at which the human body absorbs RF energy. Cell phones must comply with these SAR limits to ensure that the RF exposure is below levels considered safe.

Thank you for your purchase, we look forward to supporting you and your team.

**Customer Support**

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