WallHound-Pro Wireless Detection and Deterrent Alert

User Manual Version 2.1

Table of Contents

Introduction

WallHound-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.

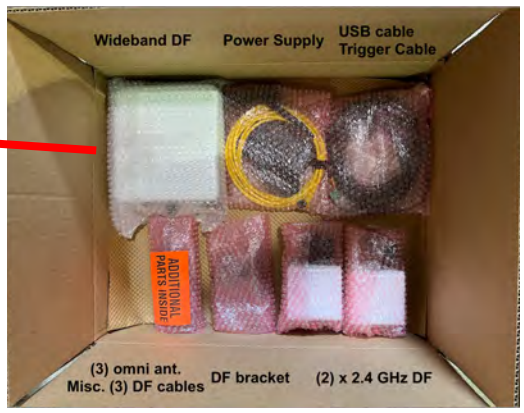
WallHound-Pro is completely self-contained and requires no connection to any PC to fully function. The unit can be affixed to any wall or optional stanchion mount making it portable. WallHound-Pro alerts are loud and visible to all staff, visitors and security personnel making it a wireless threat detector and also a deterrent that reminds everyone to refrain from using any wireless devices in secured areas where they are prohibited or illegal.

Once WallHound-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 user) are deemed harmless, the device can be whitelisted using WallHound-Pro's built in software so that it will not trigger any future alerts.

All parameters and adjustments are made only from WallHound-Pro's built-in touchscreen by designated security personnel including auto and manual thresholds, alert settings, international cellular bands and more. WallHound-Pro supports optional direction finding antennas allowing users to pinpoint specific corridors and areas of interest without triggering alerts in other areas where wireless devices are allowed.

Unboxing

WallHound-Pro unit ships with omni-directional antennas and power supply. The optional DF antenna kit ships in this same box (18" x 23" x 14" (25 lbs total)) but optional stanchion kit will arrive in one separate box.



WallHound-Pro optional stanchion mount ships in one box (34" x 17" x 7") that includes base weight, pole and L bracket with handle. Total weight of optional stanchion mount box is 25 lbs.

Information About AT&T FirstNet Emergency Network

What Is FirstNet®?

FirstNet® is a cellular network communications system designed to deliver priority and pre-emptive communications for first responders and other organizations involved in critical infrastructure and public health and safety. Developed in a public-private collaboration between the First Responder Network Authority and AT&T, the network is built to close communications gaps in public emergencies.

The key objective for FirstNet® is to handle maximum first responder traffic even during a peak emergency. Since FirstNet can only be used by those with a specialized device, there is almost no risk of the network going down or for network congestion by non-FirstNet users. This robust design makes it a cornerstone of strategic planning for smart cities.

While communications with emergency responders are critical at *any* time, the stakes are especially high during catastrophic events that affect a large population. When a city, region, state or the nation experiences a natural disaster or a terrorist attack — most memorably, events such as the 9/11 disaster, Hurricane Katrina and the Boston bombing — cellular networks can quickly become overloaded, preventing dispatchers and first responders from communicating quickly and effectively.

If you are responsible for critical communications in a municipality, in which police stations, fire stations, and other emergency service providers depend on cellular networks for communications, today you have the opportunity to improve your city's disaster preparedness with FirstNet communications.

Many other organizations qualify too, including hospitals, ambulance services and a second tier of services known as "extended primary." These include critical infrastructure systems and services such as water treatment plants, the power grid and security services.

What Is Band 14, and How Does It Work?

The need for a first responder network with dedicated spectrum was recognized in the wake of September 11th 2001, after first responders found it difficult to communicate over the congested cellphone network. In 2012, Congress passed the Spectrum Act. This act set aside 20 MHz of highly desirable spectrum in the 700 MHz frequency band, known as Band 14, which was to be reserved exclusively for emergency communications. Low-band spectrum like the 700 MHz band provides several advantages, including the ability to better penetrate walls and other obstacles. It helps to ensure excellent coverage.

In the decade since the Spectrum Act was passed, the FirstNet network has expanded and can be accessed by 99% of the U.S. population. This rapid expansion in coverage can be attributed to AT&T's strategy to give FirstNet users access to *all* bands on the AT&T network with priority and pre-emption over non-FirstNet users. This means that if there is a signal, FirstNet users will have coverage, even in remote areas where Band 14 may not be deployed yet.

Who Owns FirstNet and Band 14?

FirstNet is owned by the First Responder Network Authority, an independent authority within the U.S. Department of Commerce. Chartered in 2012, its mission is to ensure the building, deployment, and operation of the nationwide broadband network that equips first responders to save lives and protect U.S. communities.

Band 14 is maintained through a public and private collaboration. The Spectrum Act allocated about $7 billion to kickstart construction. However, a majority of the funding comes from AT&T. Over the course of 25 years, it is expected that AT&T will spend in upwards of $40 billion to build and operate Band 14.

In exchange, AT&T can run normal commercial traffic across the band when everything is working properly. However, in the event of an emergency, AT&T will give FirstNet® users priority and pre-emption over non-FirstNet users and, if necessary, drop all commercial traffic and dedicate the network exclusively to first responders, along with the extended primary group as bandwidth allows. For this reason, a normal cellphone might stop working during a crisis, but a FirstNet-enabled device will continue to work.

How Do I Qualify for FirstNet and Band 14?

The idea behind FirstNet is for important first responders, city services and infrastructure to continue functioning in the event of an emergency. Given that mandate, the list of FirstNet approved organizations is broad. In fact, many organizations are surprised to find they qualify.

For example, drilling and gas wells all qualify for FirstNet, as do Internet connected irrigation systems, waste disposal and septic tank services. Both short and long haul railroad carriers can use the network, as can the postal service and other private postal carriers.

The list of extended primary services also includes highway and bridge construction projects, chemical engineering services, school bus systems, various airport and air control functionaries as well as transportation and licensing providers. It is worth investigating, if you think that your company or organization might qualify.

What Devices Support FirstNet and Band 14?

When it comes to FirstNet compatibility, there are two categories of devices:

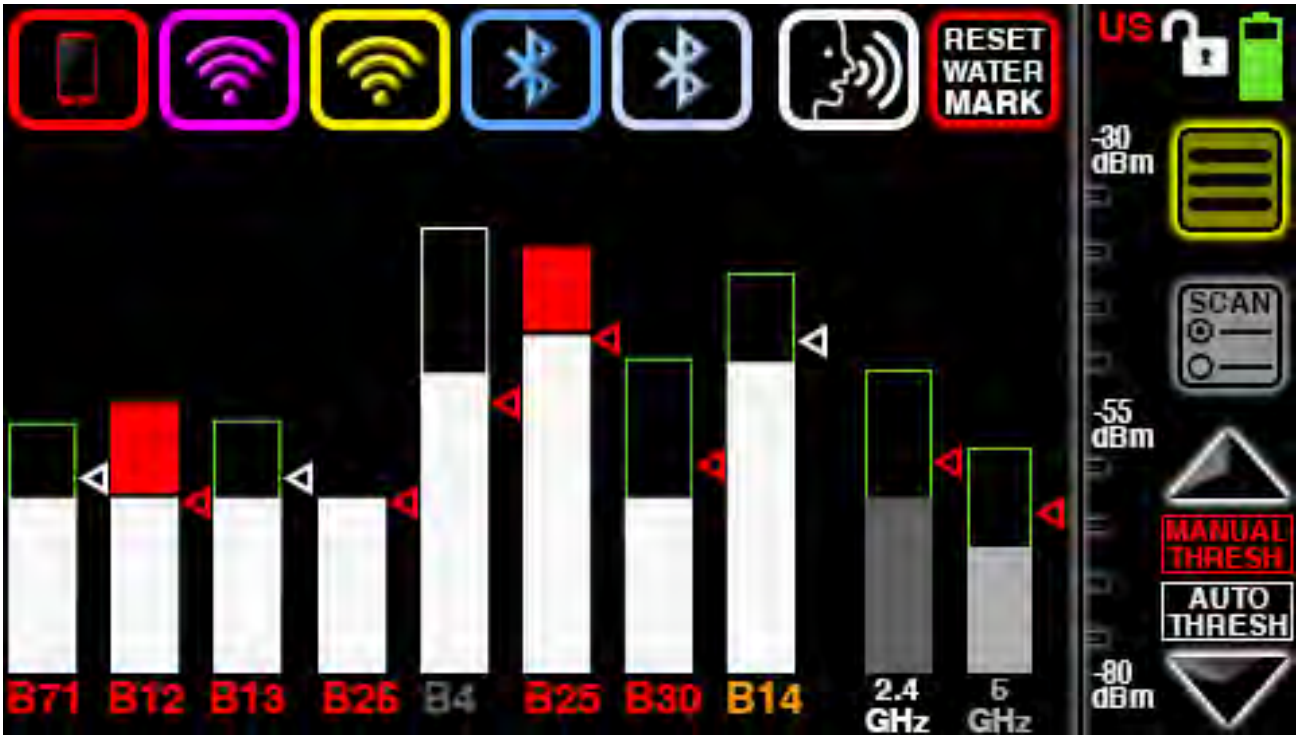
1. Products that meet FirstNet requirements, pass certifications, and support FirstNet features but do not support band 14. These do not have a FirstNet Ready designation.

2. Consumer products that meet FirstNet requirements, pass certifications, and support FirstNet features and band 14. These are known as FirstNet Ready™.

3. Products that meet FirstNet requirements, pass certifications, and support FirstNet features and band 14 and are certified for use by qualifying commercial and emergency response users. These are known as FirstNet Capable™.

4. Products that meet FirstNet requirements, pass certifications, and support FirstNet features and band 14, and have an extra layer of certifications for use by qualifying commercial and emergency response users. These are known as FirstNet Trusted™. Digi's FirstNet certified cellular solutions meet these requirements, which include a much stricter level of security compliance.

For best FirstNet performance, you want to select a device that is FirstNet Ready™, if you are a consumer, or a FirstNet Capable™ or FirstNet Trusted™ device if you use the device in a commercial or government capacity. First responders, medical units and critical services should opt for FirstNet Trusted™ devices. You can find Digi FirstNet Trusted solutions on our FirstNet page.



Main Measurement Screen

WallHound-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.

Shows security status of physical lock and key. A locked lock icon does not allow any changes.

Displays current charge to internal battery system. Internal battery lasts 2-5 hours depending upon amount of nearby wireless activity.

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.

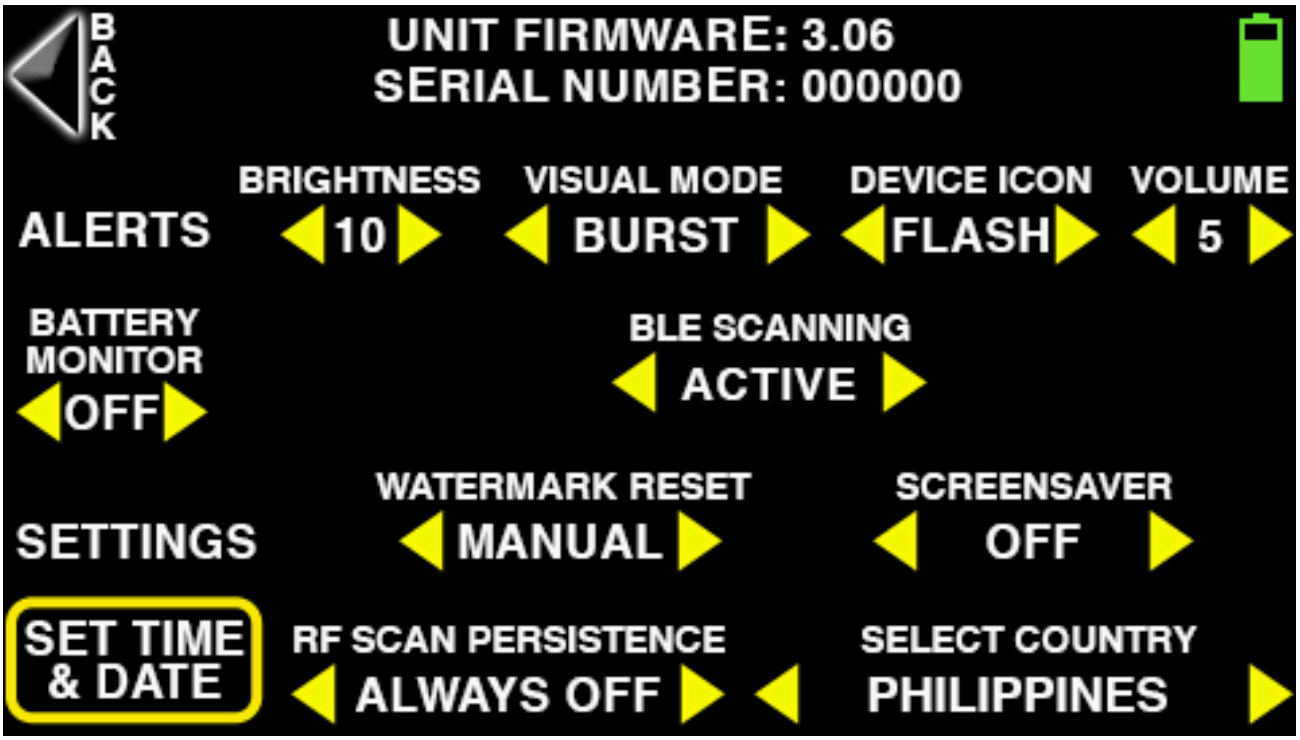
Suspends scanning of all cellular, Wi-Fi, bluetooth, BLE, 2.4 GHz CW and 5 GHz CW signals. Simply touch this button and then choose one or more buttons on the top to suspend scanning.

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 WallHound-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

WallHound-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 yellow arrow to decrease brightness of the main alert display on a scale of 1 to 10. Press the right yellow arrow to increase brightness.

Press the left or right yellow arrow to toggle between 3 different visual alert modes: burst, strobe or none. Burst is a gradual fade up and down. Strobe flashes on and off. None turns off the large visual alerts.

Press the left or right yellow arrow to toggle between 2 different visual alert modes on the LCD touchscreen: flash or none. The device detected will flash on and off when flash is shown. There will be no device icon shown at all if none is shown

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

Press the left or right yellow arrow to toggle the battery audible alert ON or OFF. WallHound-Pro normally operates on AC power, so this monitor only refers to the power remaining in the internal sealed backup battery. The internal battery provides 2-5 hours of power depending upon amount of nearby wireless activity.

Ask your BVS sales manager for a special firmware option to put BLE into passive mode so it cannot transmit at all.

Press the left or right yellow arrow to toggle between active and passive BLE scanning. This toggle is important for users requiring absolutely no RF transmissions at all in their facility. See the BLE Device ID screen section of this manual for more information on this feature.

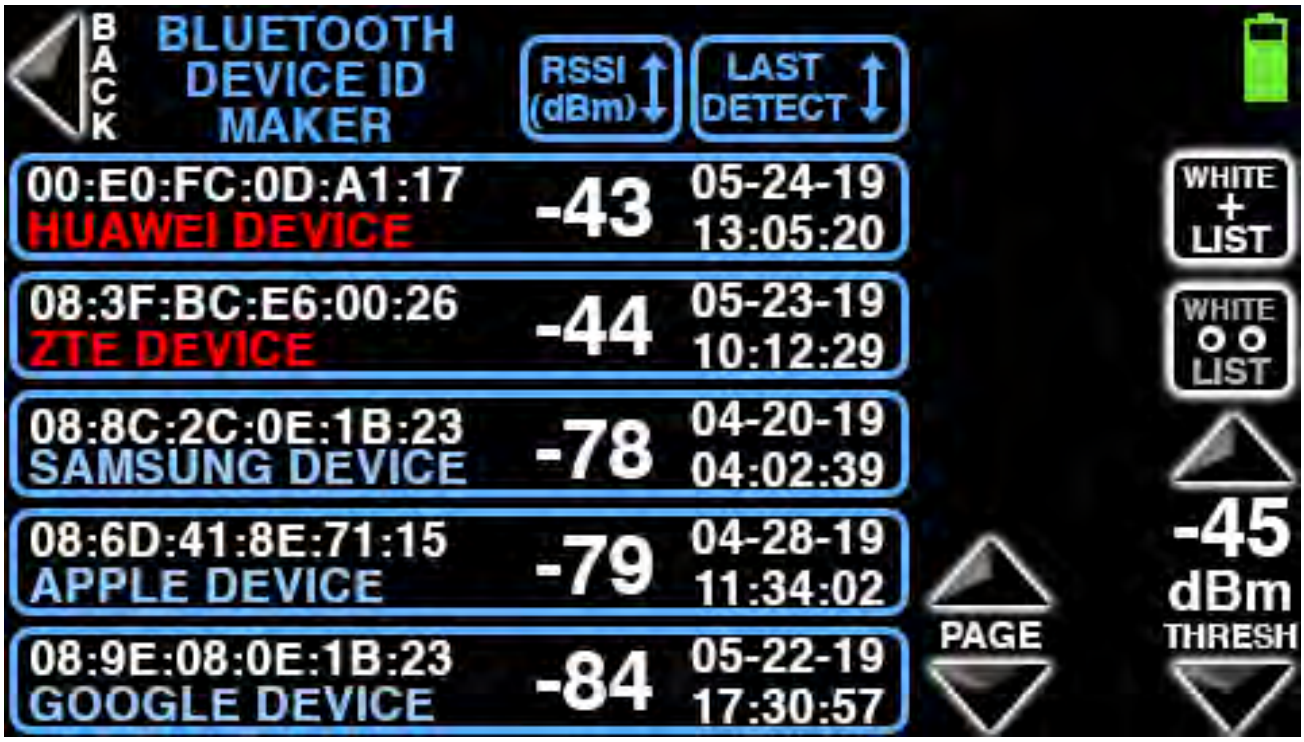
Choose between watermark reset choices: MANUAL, 5 SECS or 30 SECS. Selecting MANUAL allows users to view a profile of signals built up over time such as overnight when security personnel might not be present. The other two selections will simply erase the watermarks automatically after 5 seconds or 30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

WallHound-Pro lists all Wi-Fi 2.4 GHz, Wi-Fi 5 GHz, Bluetooth and Bluetooth low energy demodulated devices detected in their respective lists. 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

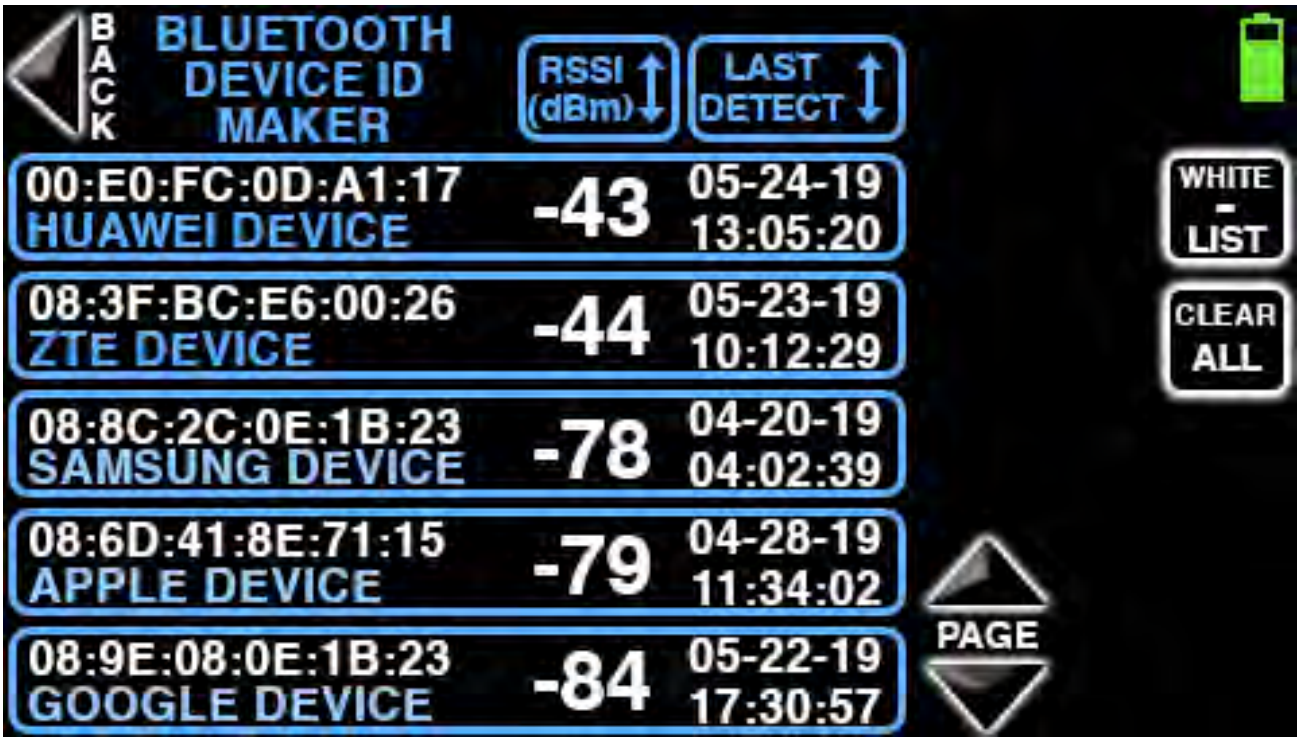
Each device detected includes MAC address, device name, RSSI in dBm and time stamp of last detection. Device names that appear in red have broken the threshold set by the user.

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.

WallHound-Pro RF Transmission Activity Overview

WallHound-Pro cellular scanning

- completely passive (for 3G/4G/5G non MMWave bands).

Bluetooth Classic (pre-5.0) – Technical Overview

Although Bluetooth Classic (BR/EDR) is largely legacy, some devices in the wild still rely on it. Therefore, WallHound-Pro continues to support scanning for these signals. However, it's important to understand the limitations inherent to the protocol:

- No Passive Scanning Capability
  Bluetooth Classic inherently requires active participation in any communication. Even during inquiry scan or page scan phases—when the device is only listening—it will respond with packets, thereby briefly transmitting.
- Low Power Modes (e.g., Sniff, Park)
  These modes reduce transmission frequency but do not eliminate it. Devices still emit periodic control packets to maintain synchronization with the master. Keep in mind NO sensitive data payload is transmitted.
- Unconnected or Non-Discoverable State
  A Bluetooth Classic device that is powered on but neither discoverable nor connectable may not transmit regularly. However, this is more akin to being offline, not a true "passive" state suitable for RF-restricted zones.

Ask your BVS sales manager for a special firmware option to put BLE into passive mode so it cannot transmit at all.

Bluetooth Low Energy (BLE) – Enhanced Scanning Control

In contrast, BLE (introduced in Bluetooth 4.0) supports true passive scanning:

- In PASSIVE mode, the WallHound-Pro can silently monitor BLE advertising packets without generating any RF transmissions.
- In ACTIVE mode, the device will periodically transmit scan requests to obtain additional data from advertising peripherals.

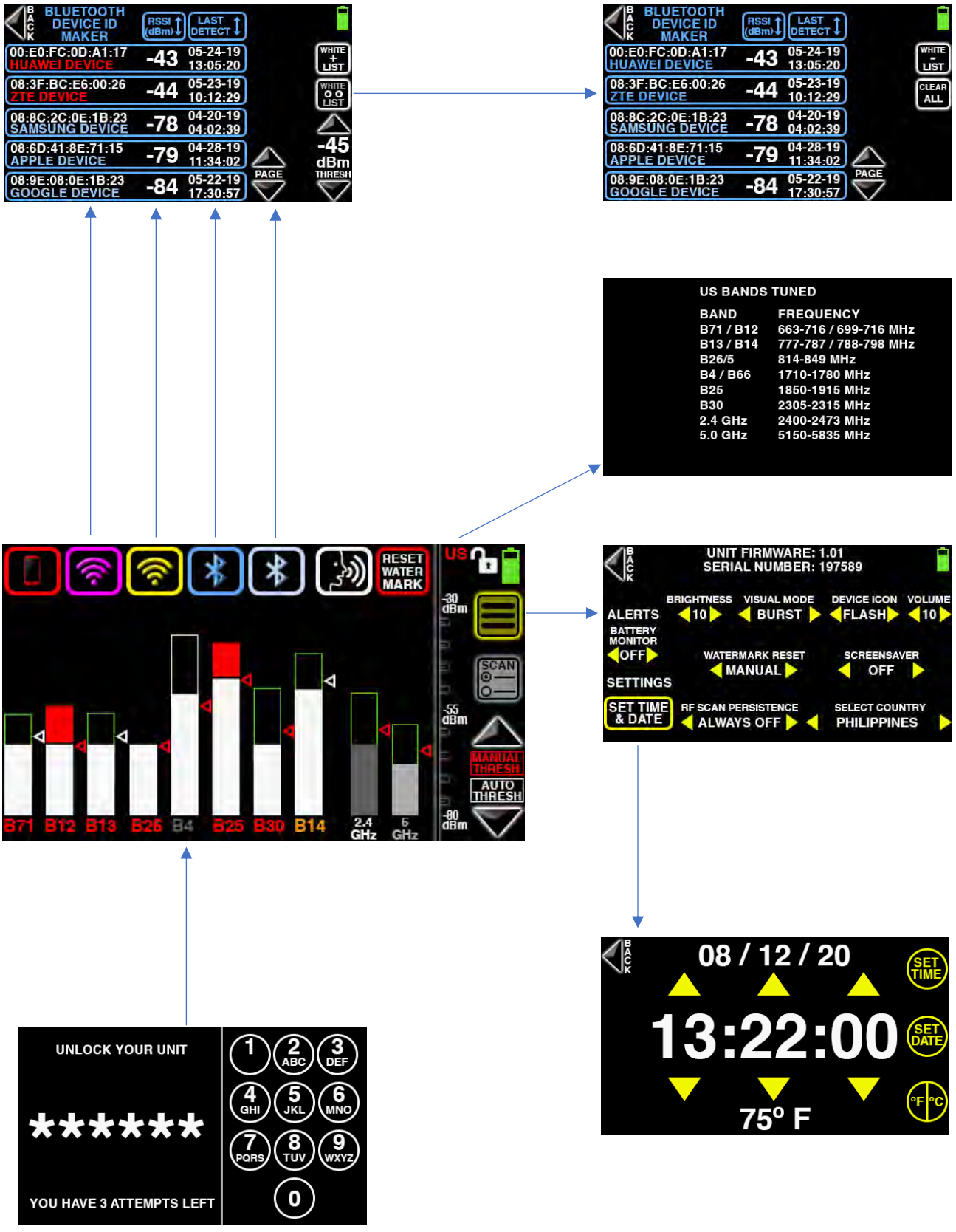
This distinction allows users to tailor WallHound-Pro's behavior based on operational requirements - whether for enhanced visibility or strict emission control.

WallHound-Pro Operational Recommendation:

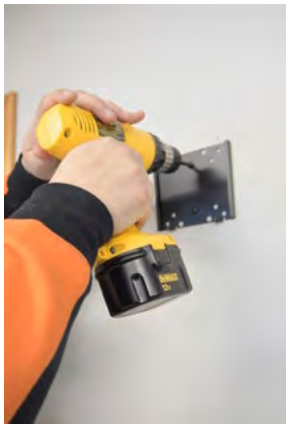
If you are operating in RF-sensitive environments where zero transmissions are mandated, you now have two configurable options with firmware v3.06:

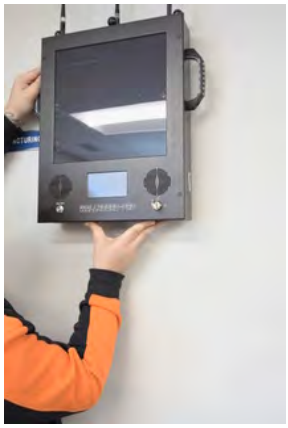
1. Disable Bluetooth Classic scanning entirely — ensuring no transmission related to BR/EDR occurs.
2. Enable BLE in PASSIVE mode — to passively listen for BLE devices without emitting any radio signals.

WallHound-Pro Screens Flow Diagram



WallHound-Pro Hardware



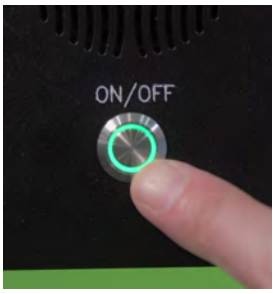


WallHound-Pro ships with everything you need to start securing your facility from wireless threats including a power supply, (3) omni-directional antennas, wall mounting hardware and (2) keys.

Mounting Your WallHound-Pro

The VideoSecu ultra slim flat mounts are incredibly easy to install, and feature a low-profile, sliding plate design that places the WallHound or WallHound-Pro very close to the wall for a clean look, while also providing a unique combination of simplicity and security. Its **maximum load weight is 66 lbs**. And it is VESA 75/100 compliant.

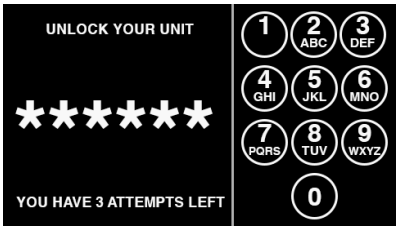
Charging



Use the included power transformer to both power and charge WallHound-Pro's internal backup battery. After securely connecting and tightening the connector, press the power button to turn on your unit. Be sure to provide AC power to your unit for several hours to fully charge the internal backup battery. Once charged, the backup battery allows WallHound-Pro to be disconnected from AC power and moved around without interruption of wireless detection. If your unit is powered while you plug in the provided charger, the power button will blink green to indicate that the unit is being charged.

Security

WallHound-Pro includes a provision to securely lock all settings with a physical key to prevent tampering. Settings such as thresholds, alerts and even power may not be changed while the WallHound-Pro is locked. In addition, WallHound-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.



WallHound-Pro includes dry contacts allowing users to connect external alarms and recording devices upon wireless detection by WallHound-Pro. Consult this manual further down for a wiring diagram or contact your BVS sales or support representative for answers to questions.

Firmware Updates

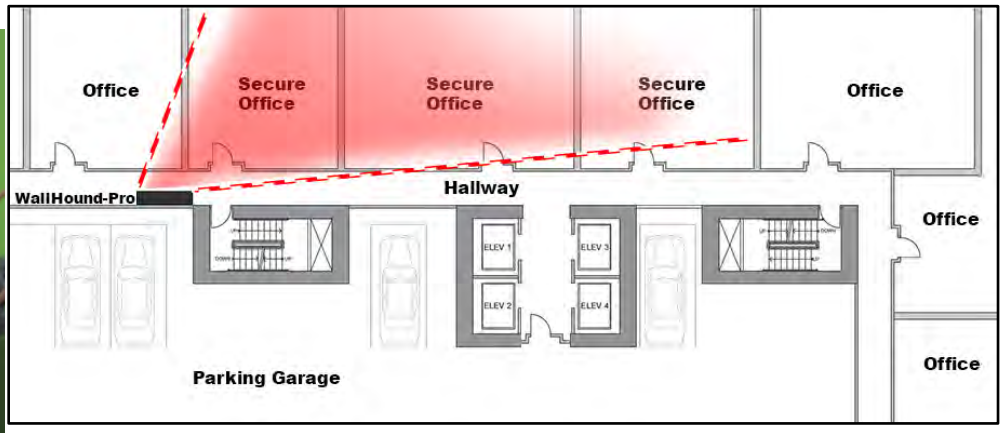
WallHound-Pro can be updated via its dual USB port which contains two different modes for update.

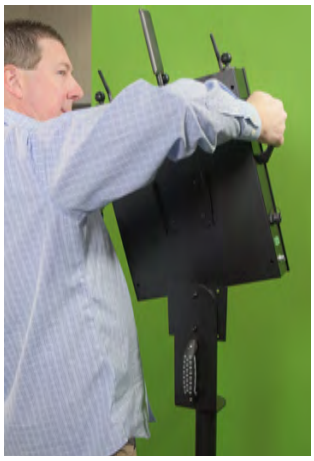
Mode 1: Pins 1 and 2 need to be shorted on the green dry contact connector allowing main 32-bit processor to receive a firmware update as shown.

Mode 2: With NO shorting as a default, the USB port can receive the 16-bit processor firmware update for the alarm board. This would only be necessary if there is a voice audio file that needs to be uploaded to unit. Please consult with BVS support for details.

Optional Hardware

WallHound-Pro supports an optional direction finding antenna kit including (2) dual band directional antennas to cover both 2.4 GHz and 5 GHz, (1) wideband directional antenna covering 700 MHz to 2.7 GHz, mounting brackets and cables. Simply unscrew the SMA mounted omni-directional antennas that are included with your unit and replace them with the directional antennas. Be sure to connect the larger wide band antenna to the center SMA connector and smaller directional antennas on either side of the larger one. All of these antennas cover the frequency range of any common wireless threat, but the directional antennas allow much more flexibility in your unit's placement and coverage. For example, you may have to experiment a little if you wish to only detect wireless activity in a narrow corridor and secure rooms but exclude a nearby area in the opposite direction where wireless devices are more commonly used and not prohibited.





WallHound-Pro supports an optional portable stanchion allowing the unit to be easily moved and placed into temporary security setups without access to AC power for instance. Simply slide the back of the unit onto the mounting plate included with your optional stanchion pole. Use a long (at least 8 inches) Philips head #1 screwdriver to fully secure the unit to the stanchion mount.

WallHound-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.

Installation Instruction

Tools Neededfor Assembly

Stud finder (for wood stud wall)	Drill bit (for wood stud wall)	Measuring tape
Pencil Mark	Masonry drill bit (for concrete wall)	Phillips screwdriver
Electric drill	Ratchet with 7/16 inch socket	Level

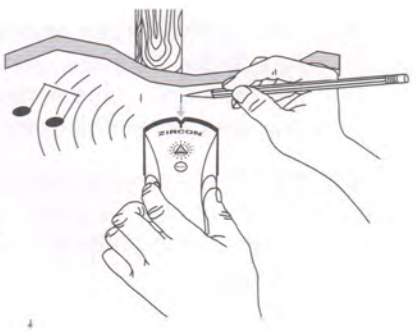
Use a qualified professional to properly install. VideoSecu not liable for the improper use or installation of its products. Common hardware provided. Installers are responsible to provide additional hardwares. The TV must not exceed 66 lbs, which is the maximum weight capacity of the bracket.

Wood Stud Wall Installation

Step 1. Locate the Wall Studs

Wall studs run vertically (up and down) inside the wall, behind the drywall or plaster. You must attach the mount wall plate to one wood stud.

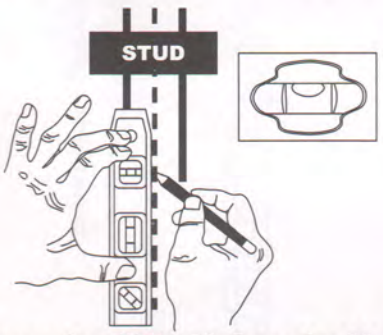
1-1. Using a stud finder make marks at the edges of the stud
1-2. Using level mark the centerline of the stud.

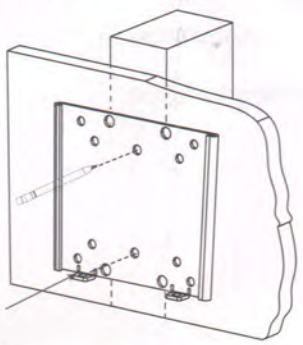


Step 2. Drill Pilot Holes

2-1. Hold the wall plate so the holes line up with the stud center lines.
2-2. Level the wall plate using level, and draw horizontal (side-to-side) lines where the stud center lines and the mounting plate holes line up.
2-3. Drill pilot hole, this is a hole slightly smaller in diameter than the diameter of the big screws, 2 inches deep into the stud at each mark.

Please note that the forearm should be on the top.





Concrete Wall Installation

Step 1. Drill Mounting Holes

1-1. Hold the wall plate against the wall where you want to mount the screen.

1-2. Level the mounting plate using level, mark off holes to be used for securing the wall plate and place the wall plate aside.

1-3. Using a masonry bit, drill 2 inch deep holes at the spots marked in the previous step.

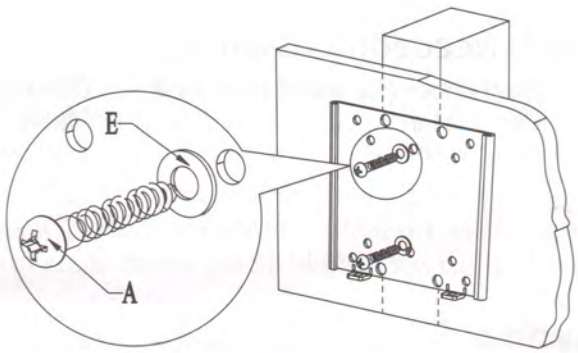
Step 2. Install Anchors

Find the plastic concrete anchors(do not use it in wood stud wall). Place an anchor in each hole Tap each anchor flush with the wall using a hammer.

Step 3. Mount Wall Plate

Using the provided lag bolts, tighten each bolt with an open ended socket wrench. Do not use power drill and do not over tighten the lag bolts

Please note that the forearm should be on the top.

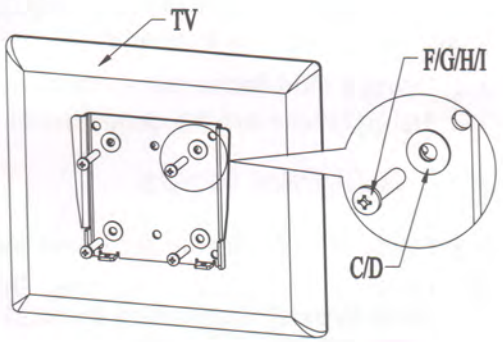


Step 4. Attach TV or monitor to the TV plate

4-1. Four mounting holes in the back of the flat panel TV or Monitor, sometime its covered by plastic cap or stand remove the cap or stand to exposethe mounting holes check the TV manual if your can not find them

4-2. Pick up the screen and then Attach the TV plate using screws, flat washers . Use screws that fit securely into your screen at least 3 full turns.

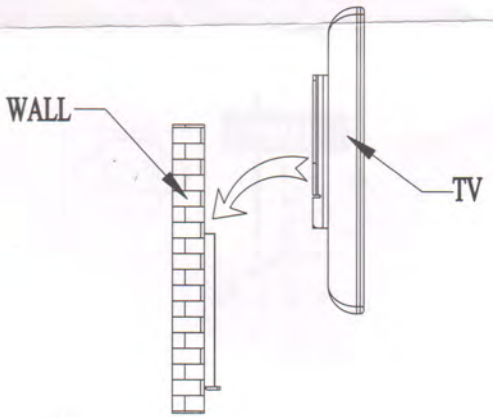
4-3. If the back of your screen does not lie flush with the TV plate, place washers between the plate and screen back to fill the gap.



Step 5. Hang the Screen on the Wall Plate

5-1. Two people, pick up the screen and hang the screen on the top edge of the wall plate.

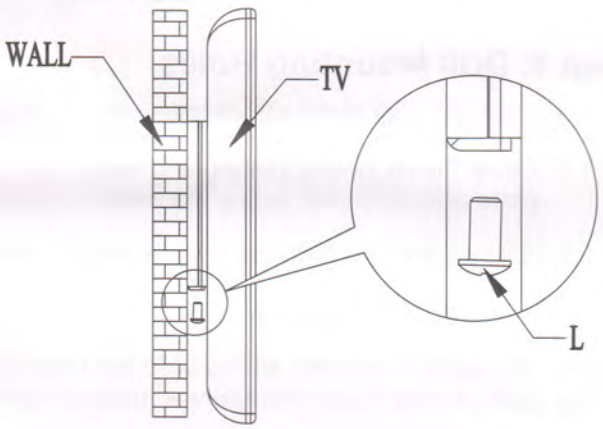
5-2. Slowly lower the screen so that it hangs on the Mounting Plate.

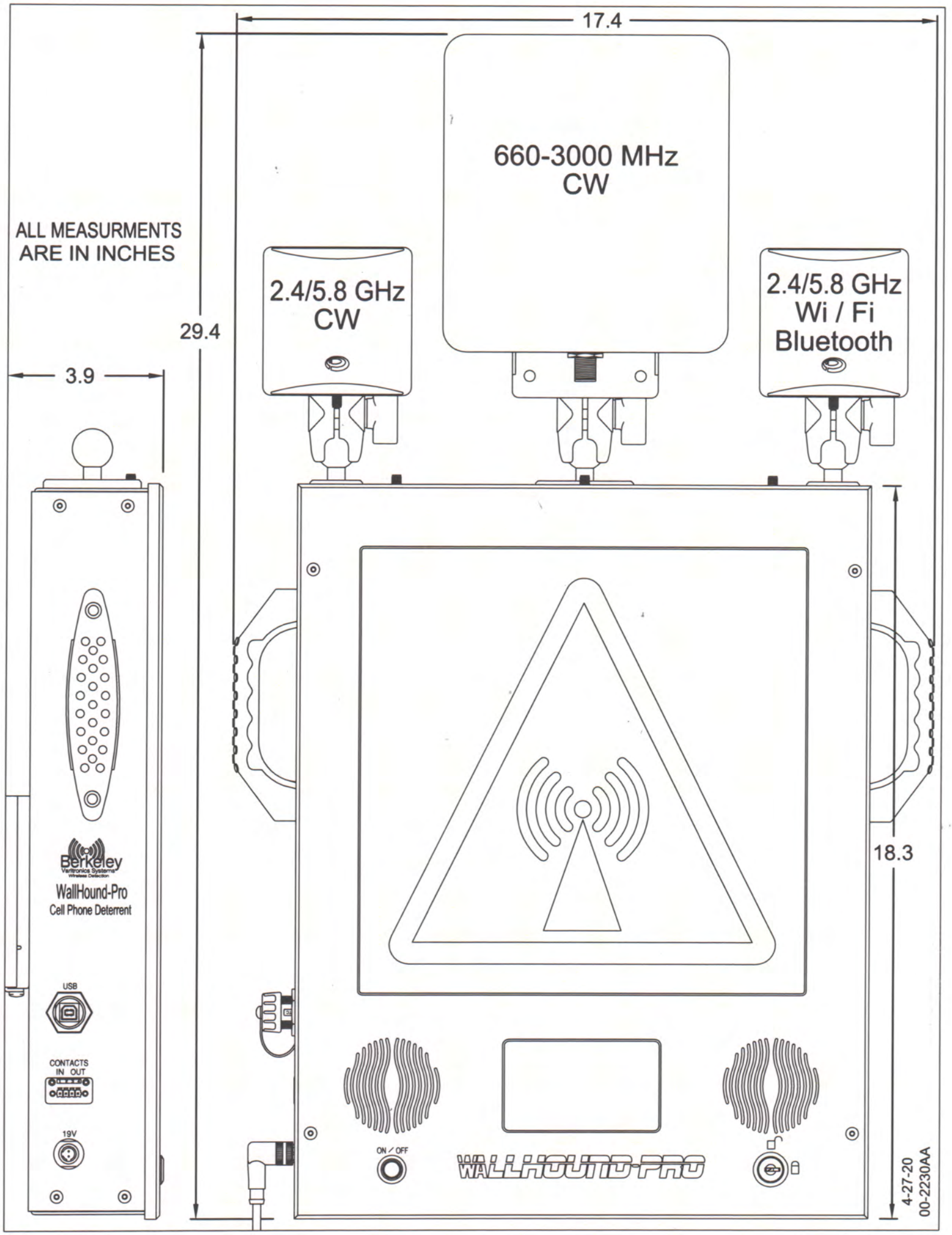


Step 6. Tighten Both Security Screws

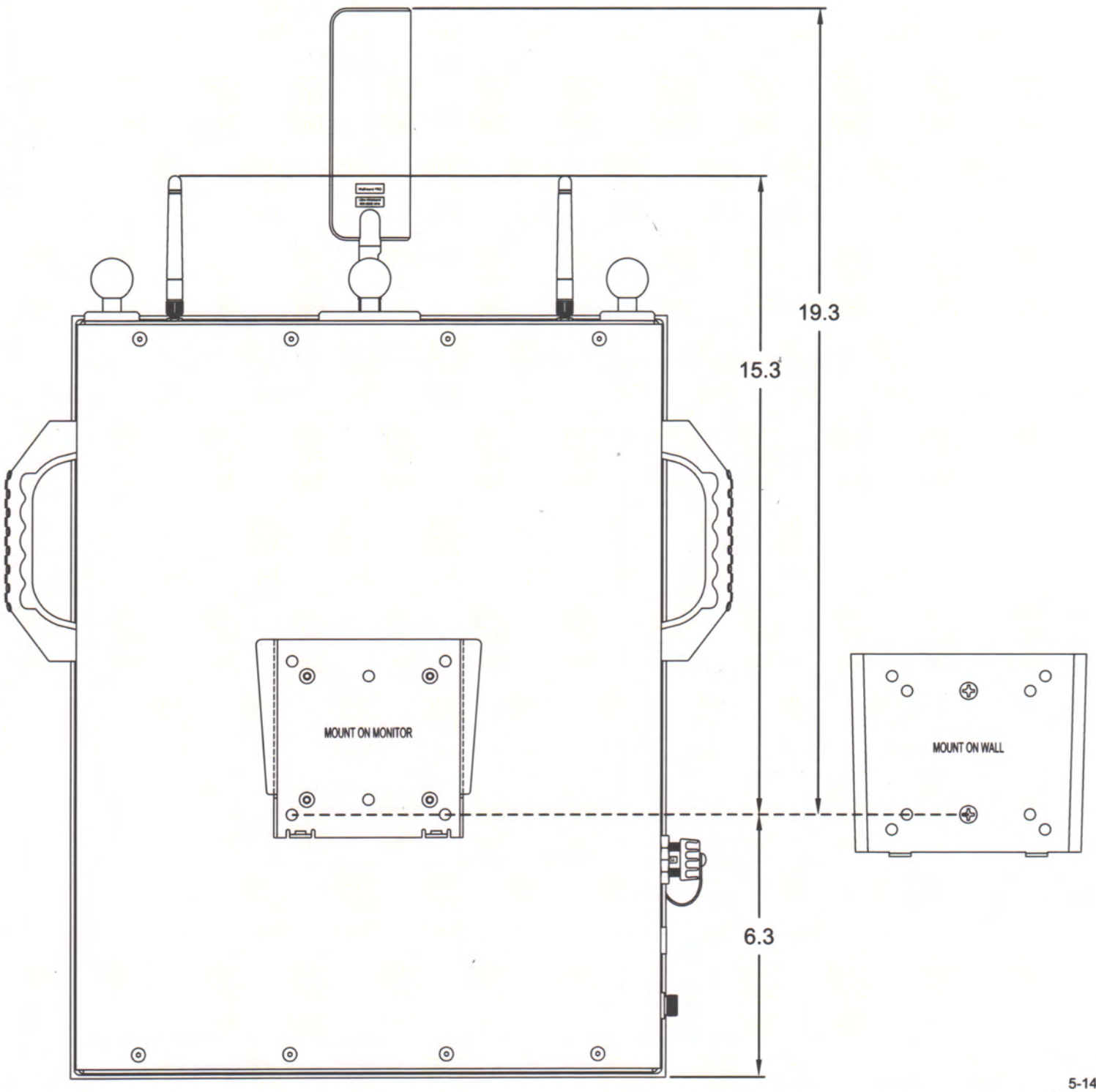
6-1. Tighten the security bolts. This will prevent the screen from moving up on the mounting plate.

6-2. Make the wall plate and TV plate in a whole.



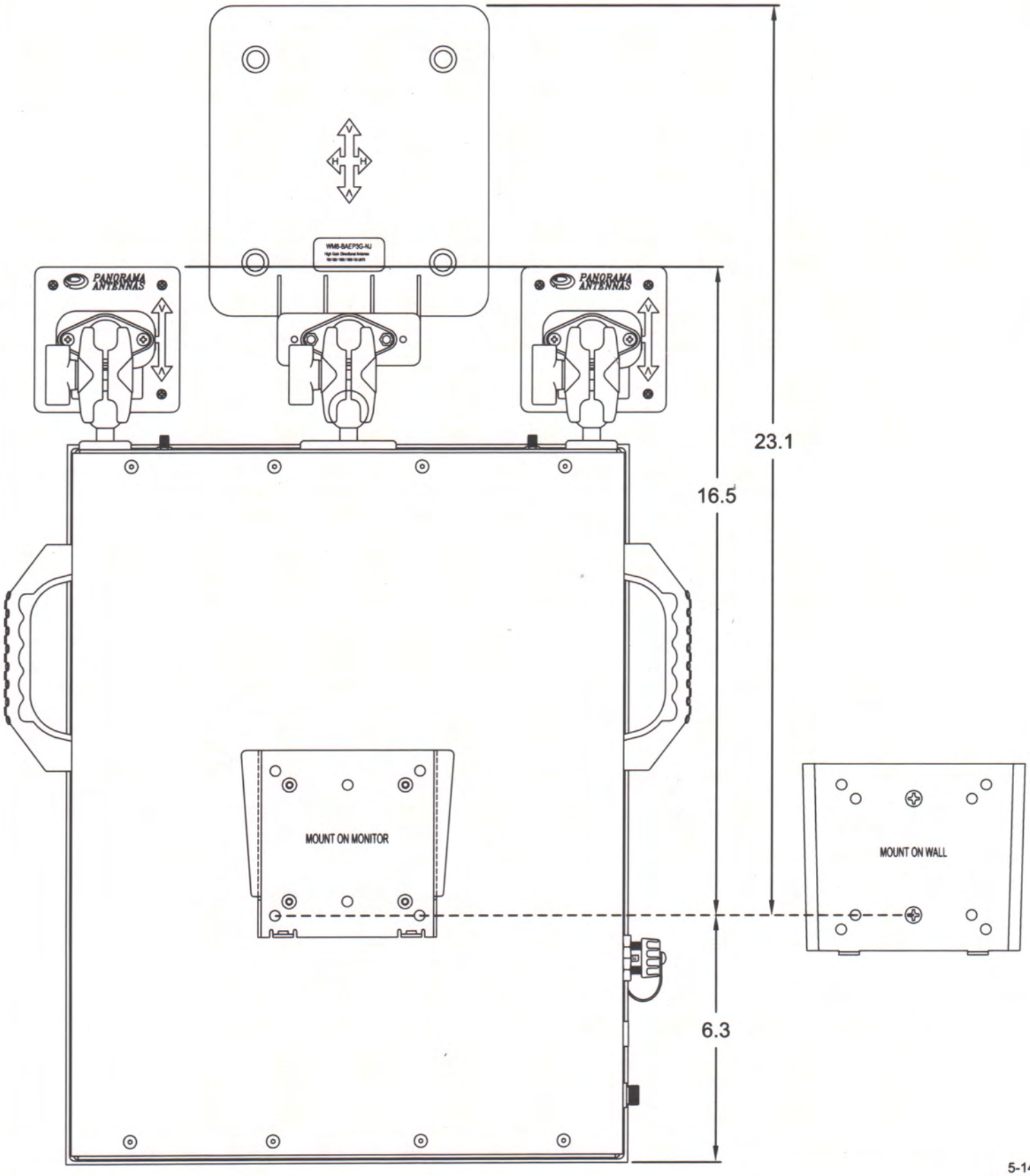

17.4
660-3000 MHz
CW
ALL MEASURMENTS
ARE IN INCHES
2.4/5.8 GHz
CW
2.4/5.8 GHz
Wi / Fi
Bluetooth
29.4
3.9
18.3
Berkeley
Varitronics Systems
WallHound-Pro
Cell Phone Deterrent
USB
CONTACTS
IN OUT
19V
ON / OFF
WALLHOUND-PRO
4-27-20
00-2230AA

REAR VIEW
OMNI DIRECTIONAL ANTENNAS
ALL MEASUREMENTS ARE IN INCHES

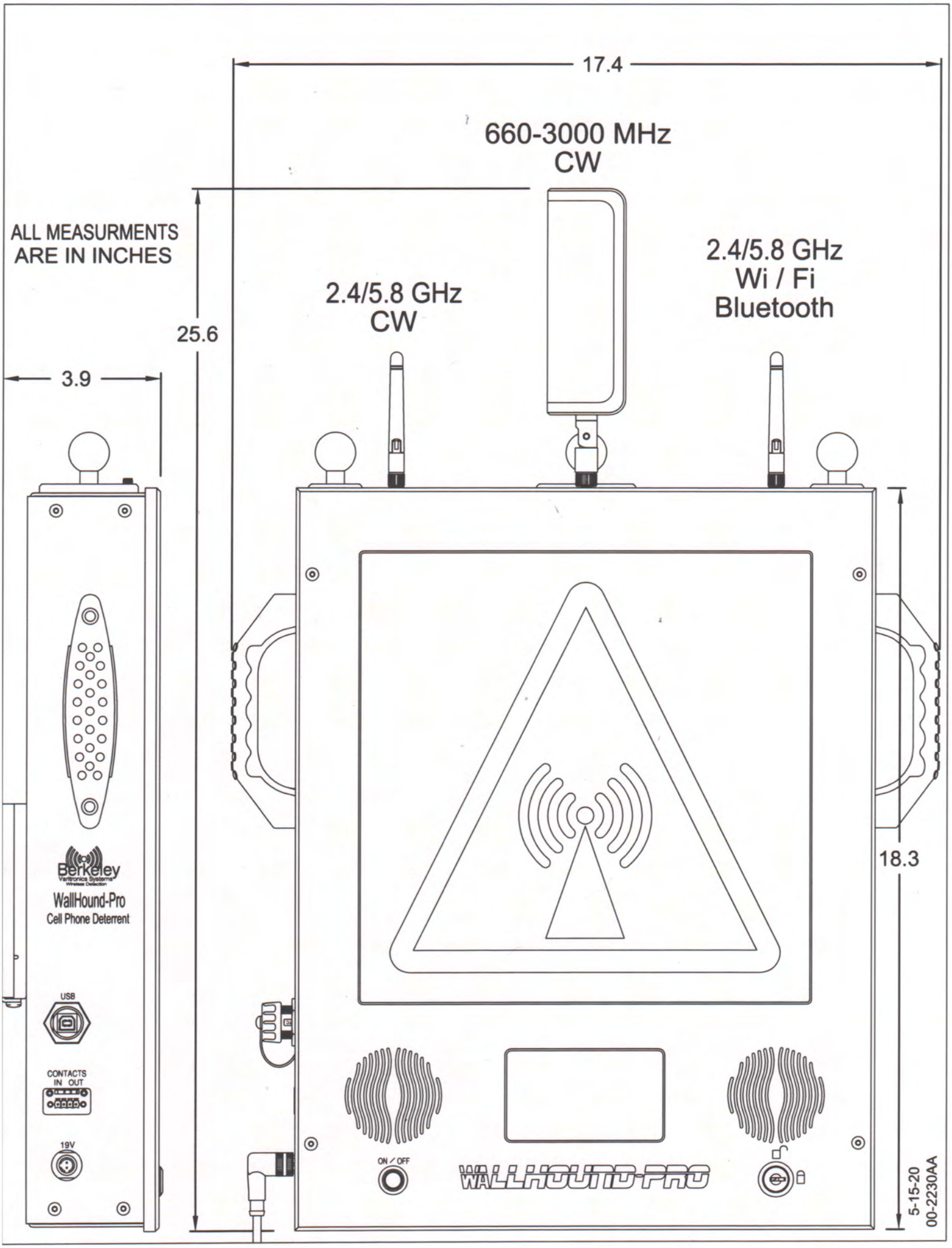


5-14-20
00-2230AB

REAR VIEW
DIRECTIONAL ANTENNAS
ALL MEASUREMENTS ARE IN INCHES



5-14-20
00-2230AB


17.4
660-3000 MHz
CW
ALL MEASURMENTS
ARE IN INCHES
2.4/5.8 GHz
CW
2.4/5.8 GHz
Wi / Fi
Bluetooth
25.6
3.9
18.3
Berkeley
Varitronics Systems
WallHound-Pro
Cell Phone Deterrent
USB
CONTACTS
IN OUT
19V
ON / OFF
WALLHOUND-PRO
5-15-20
00-2230AA

W24-58-CP-9

M2M / WLAN

Dual Band Directional Patch Antenna

High gain directional antenna

Covers 2.4 & 5GHz for WIFI/WLAN

Ideal WIFI coverage extender for large rooms, car parks & warehouses

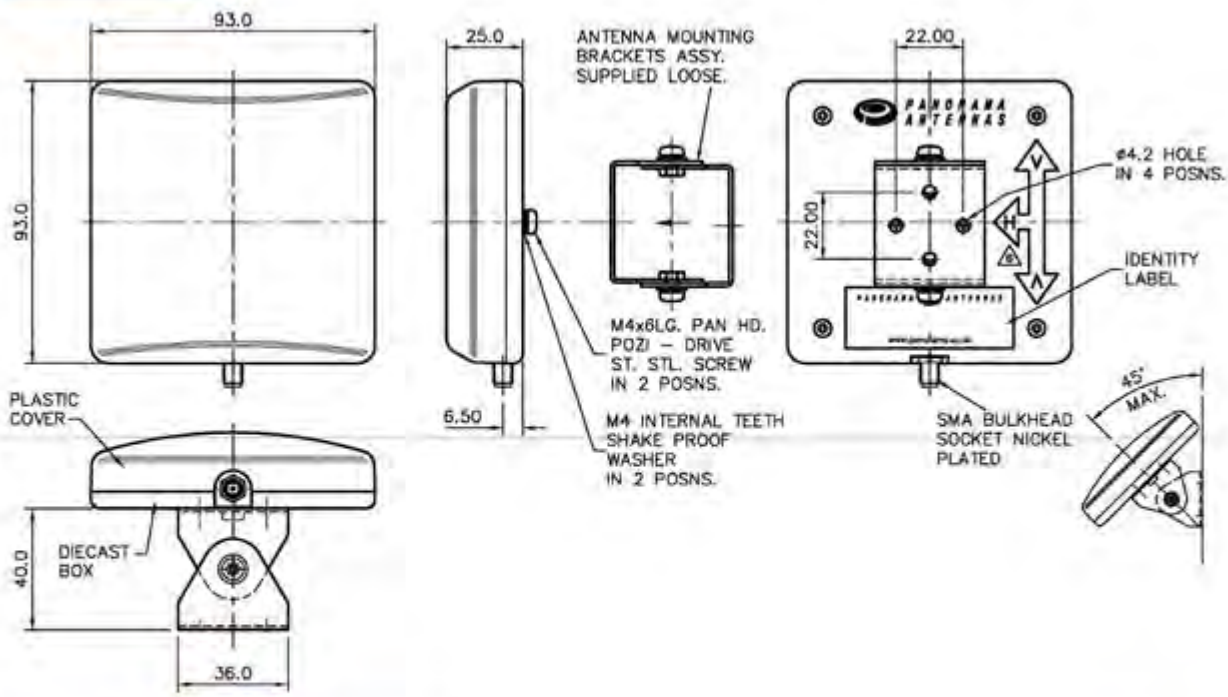
The Panorama client patch antenna is a directional wall or mast mounted antenna covering 2.4 & 5GHz for WIFI / WLAN applications.

This antenna is ideal for point to point communications or can be used to cover a wide area thanks to its relatively wide beamwidth in the horizontal and vertical planes. Several of these antennas can be used to provide cost effective sectored coverage.

The antenna is supplied with a 90 degree adjustable wall / mast mount angle bracket to give optimal mounting flexibility.

Ideal to infill network coverage black spots or to provide a consistent connection for subscriber terminals the W24-58-CP-9 is a cost effective solution to network coverage issues.

Technical Drawing



PANORAMA ANTENNAS

Panorama Antennas Ltd

Frogmore, London, SW18 1HF, United Kingdom

T: +44 (0)20 8877 4444

F: +44 (0)20 8877 4477

E: sales@panorama-antennas.com

www.panorama-antennas.com

Inbuilding

Low PIM Directional Antenna

WM8-BADEP3G-26-NJ

21/03/2016 V1

CELLPOWER

WM8-BADEP3G-26-NJ

High gain

Mast mount or wall mount

Low PIM & SAR tested to EN50385:2002

Integrate wireless services into one antenna

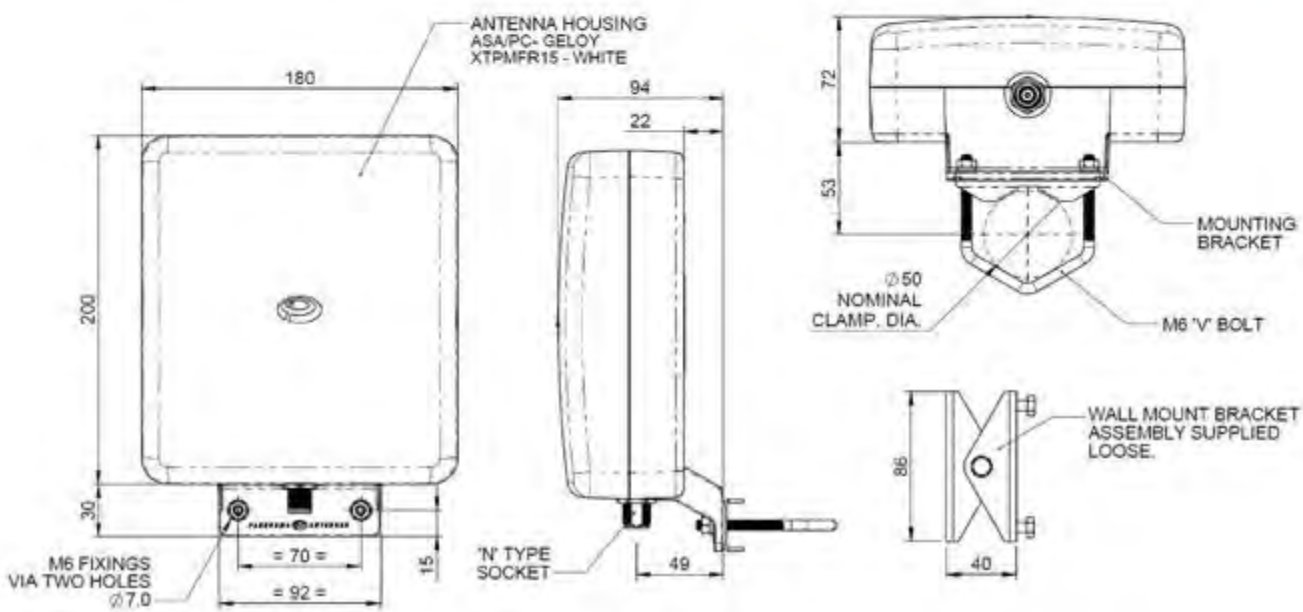
A versatile high gain directional antenna for in building applications, Panorama's WM8 range allows businesses and facilities to support multi-service/multi-operator wireless coverage. The WM8-BADEP3G-26-NJ supports 2G, 3G, 3G+ and 4G technologies including LTE, AMPS, PCS, GSM, UMTS & AWS with lower gain coverage of WIFI 2.4GHz and LTE 2.6GHz.

The WM8 range is housed in impact resistant, UV light stabilised plastic. The features a heavy duty N female connector making the product ideal for indoor and outdoor deployment, for inbuilding coverage or network infill applications.

PIMGuard Technology

This product features Panorama Antennas' PIM Guard Technology and will meet or exceed a third order intermodulation level of < -140dBc.

Technical Drawing

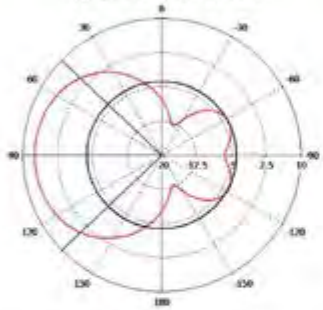


In Building Antennas

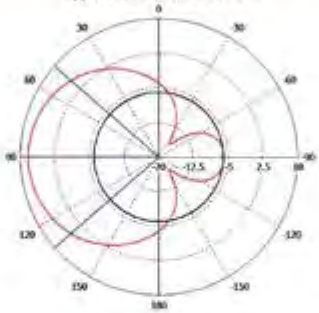
Low PIM Directional Antenna

Polar radiation plots

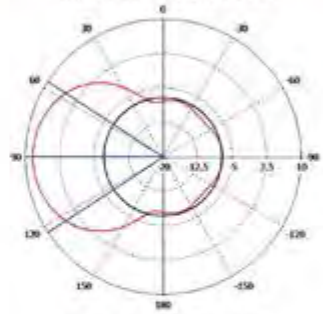
Typical H Plane 700MHz



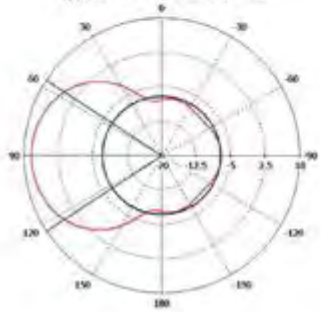
Typical H Plane 850MHz



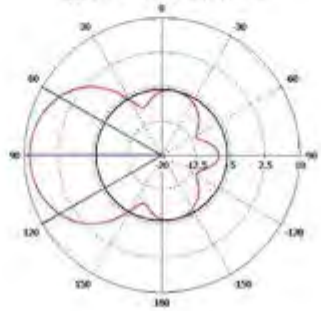
Typical H Plane 1700MHz



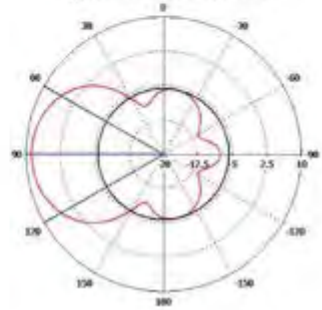
Typical H Plane 1800MHz



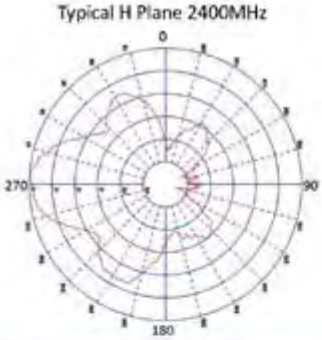
Typical H Plane 1900MHz



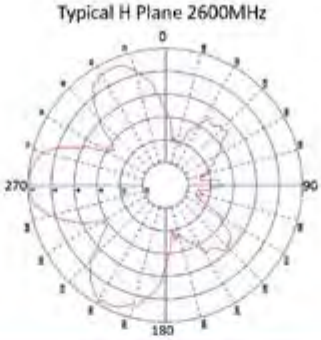
Typical H Plane 2100MHz



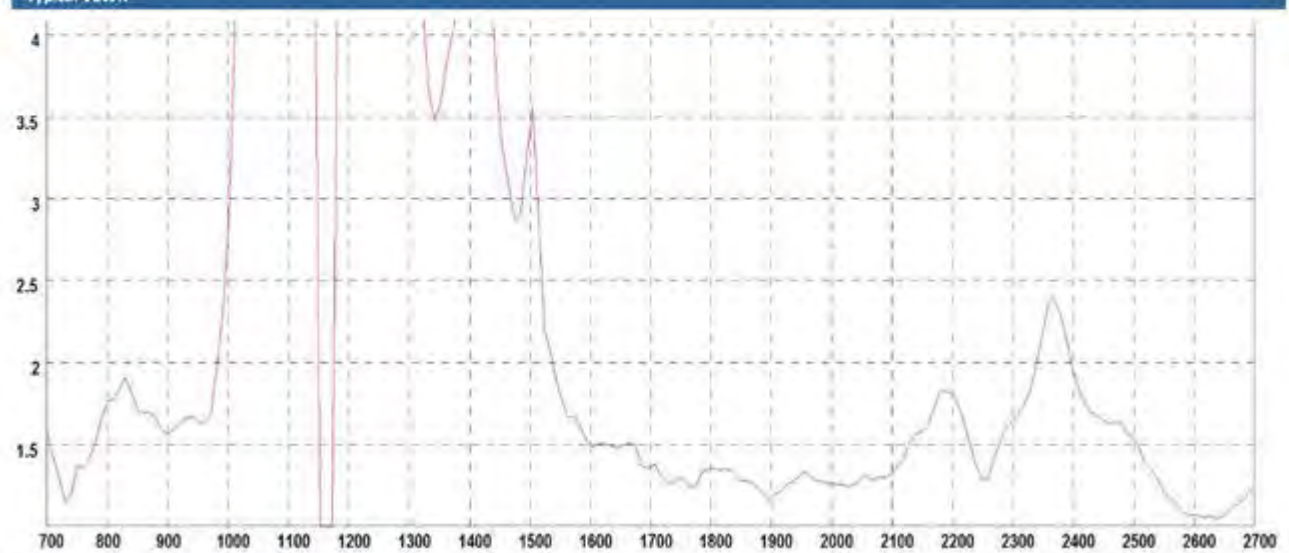
Typical H Plane 2400MHz



Typical H Plane 2600MHz



Typical VSWR



*Measurements taken looking directly into N connector on antenna housing.

In Building

Low PIM Directional Antenna

Part No.		
		WMR-BADEP3G-25-NJ
Electrical Data		
Frequency Range (MHz)		698-960, 1710-2700
Operational Band		LTE 700, AMPS 850, CDMA 800, GSM1800, PCS1900, 3G UMTS, AWS, WiFi, LTE 2.6
Peak Gain: Isotropic	LTE 700MHz, AMPS800 & GSM900	6.5dBi
	GSM 1800, PCS1900, 3G UMTS / AWS 2100	8dBi
	WiFi 2400, LTE 2600	6dBi
VSWR		<2.5:1
Polarisation		Vertical
Pattern		Directional
Typical Passive Intermod. (2x20W, 3rd ord.) dBc*		-140
SAR and 'Touch Safe' Test Data		According to 50385:2002 (Bands: 850, 900, 1800, 2100, 2600MHz)
Impedance		50Ω
Max Input Power (W)		50
Mechanical Data		
Dimensions (mm)	Height	230mm (9.05")
	Width	180mm (7.08")
	Length	94mm (3.7")
Operating Temp (°C)		30° / 170°C (22° /158°F)
Material		PC/ASA
Colour		White
Connector Data		
Type		N Socket
Mounting Data		
Fixing		Pole Mount / Wall Mount
Pole Diameter		20-50 mm (0.8 - 1.96")

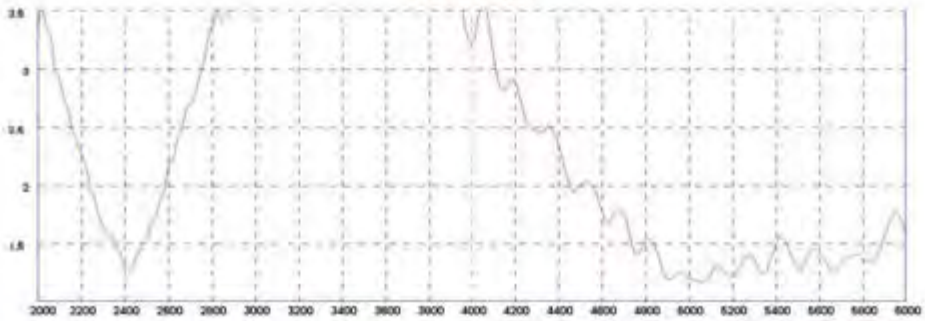
*Range PIM performance verified under controlled conditions by Anritsu PIM Master test equipment.

Panorama Antennas Ltd
Frogmore, London, SW18 1HF, United Kingdom

T: +44 (0)20 8877 4444
F: +44 (0)20 8877 4477

E: sales@panorama-antennas.com
www.panorama-antennas.com

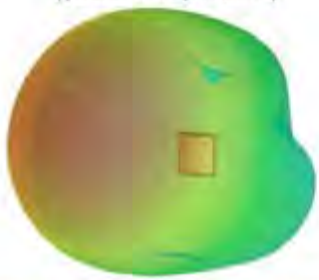
Typical VSWR



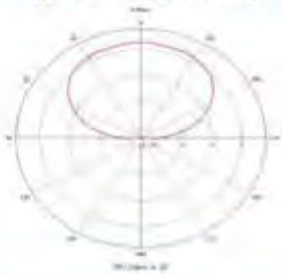
*VSWR measured in free space without additional cable

Typical H-Plane (2400MHz)

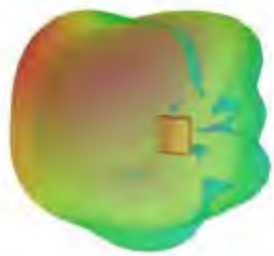
Typical 3D Plot (2400MHz)



Typical H-Plane (5400MHz)



Typical 3D Plot (5400MHz)



Part No.		
		W24-58-CP-9
Electrical Data		
Frequency Range (MHz)		2400-2485 /4900-6000
Operational Band		2.4GHz/5GHz WLAN
VSWR		≤ 2:1
Peak Gain: Isotropic		9dBi
Pattern		Directional
3dB Beamwidth	Azimuth 2.4GHz	60°
	Azimuth 5GHz	90°
Polarisation		Vertical
Impedance		50Ω
Max Input Power (W)		50
Mechanical Data		
Dimensions (mm)	Height	93 (3.66")
	Width	93 (3.66")
	Depth	25 (0.98")
Operating Temp (°C)		-30° / +70°C (-22° / +158°C)
Material		Geloy PC/ASA & die cast aluminium
Colour		Signal White
Mounting Data		
Fixing		Wall mount or Mast mount
Environmental Specification		
Wind Load / Resistance		11N at 150km/h
Radome Flammability		UL94 V0 - Halogen Free
Connector Data		
Termination		SMA socket

SPECIFICATION
PATENTED

Part No. : **TG.30.8113**

Product Name : **Apex Hinged TG.30**
Ultra-Wideband 4G LTE Antenna

Feature : LTE / GSM / CDMA /DCS /PCS / WCDMA / UMTS /
HSDPA / GPRS / EDGE /GPS /Wi-Fi
698MHz to 960MHz, 1575.42MHz
1710MHz to 2700Mhz
Typical 70%+ Efficiency and 3dBi+ Peak Gain
Dipole Swivel Terminal Antenna
Hinged 90° termination with SMA(M) Connector
RoHS Compliant

2. Specification

ELECTRICAL							
Frequency (MHz)	700~800	824~960	1575.42	1710 ~ 1880	1850 ~ 1990	1710 ~ 2170	2400~2800
Peak Gain (dBi)							
Free Space Straight	1.1	0.3	1.1	1.9	2.7	2.6	2.7
Free Space Bent	2.6	1.5	2.9	2.7	3.1	3.1	2.0
30x30cm GP center Straight	2.1	0.7	2.9	1.5	1.9	2.0	2.9
30x30cm GP center Bent	3.5	1.7	5.2	5.9	6.7	6.4	4.9
30x30cm GP edge Straight	2.6	1.3	1.7	2.1	2.1	2.3	4.3
30x30cm GP edge Bent	2.6	1.8	3.1	2.1	3.0	2.8	5.1
PCB edge Straight	1.4	1.2	0.9	2.5	3.2	3.0	1.4
PCB edge Bent	2.1	0.1	2.1	2.4	3.6	3.4	3.0
Average Gain (dB)							
Free Space Straight	-1.1	-2.2	-2.0	-1.5	-1.2	-1.3	-3.5
Free Space Bent	-1.1	-2.3	-1.5	-1.5	-1.1	-1.2	-3.1
30x30cm GP center Straight	-0.6	-1.6	-2.0	-1.8	-1.7	-1.7	-3.8
30x30cm GP center Bent	-3.5	-4.9	-2.8	-2.4	-1.8	-2.0	-3.0
30x30cm GP edge Straight	-0.6	-1.5	-1.9	-1.6	-1.4	-1.4	-3.1
30x30cm GP edge Bent	-0.6	-1.7	-1.6	-1.5	-1.2	-1.3	-3.1
PCB edge Straight	-1.0	-2.0	-2.0	-1.6	-1.4	-1.4	-3.5
PCB edge Bent	-0.8	-2.5	-1.6	-1.5	-1.1	-1.3	-3.0

ELECTRICAL							
Frequency (MHz)	700~800	824~960	1575.42	1710 ~ 1880	1850 ~ 1990	1710 ~ 2170	2400~2800
Efficiency (%)							
Free Space Straight	79	61	63	71	76	75	45
Free Space Bent	78	60	70	72	78	75	49
30x30cm GP center Straight	86	69	62	66	67	68	42
30x30cm GP center Bent	47	32	51	58	66	64	51
30x30cm GP edge Straight	88	70	65	69	72	72	49
30x30cm GP edge Bent	88	67	69	70	76	74	49
PCB edge Straight	80	63	63	69	73	73	45
PCB edge Bent	83	57	70	71	77	75	50
Impedance	50Ω						
Polarization	Linear						
Radiation Pattern	Omni						
Input Power	10 W						

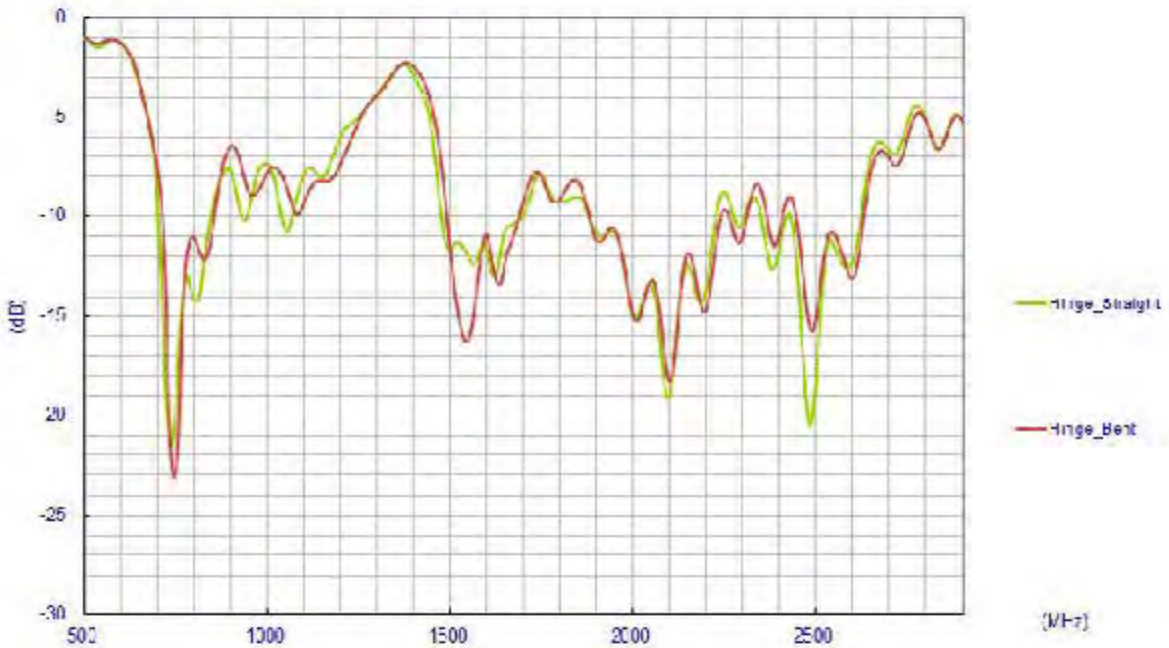
MECHANICAL	
Casing	UV Resistant PC/ABS
Connector	SMA Male Hinged 90°

ENVIRONMENTAL	
Temperature Range	-40°C to 85°C
Humidity	Non-condensing 65°C 95% RH

LTE BANDS			
Band Number	LTE / LTE-Advanced / WCDMA / HSPA / HSPA+ / TD-SCDMA		
	Uplink	**Downlink**	**Covered**
1	UL: 1920 to 1980	DL: 2110 to 2170	✔
2	UL: 1850 to 1910	DL: 1930 to 1990	✔
3	UL: 1710 to 1785	DL: 1805 to 1880	✔
4	UL: 1710 to 1755	DL: 2110 to 2155	✔
5	UL: 824 to 849	DL: 869 to 894	✔
7	UL: 2500 to 2570	DL:2620 to 2690	✔
8	UL: 880 to 915	DL: 925 to 960	✔
9	UL: 1749.9 to 1784.9	DL: 1844.9 to 1879.9	✔
11	UL: 1427.9 to 1447.9	DL: 1475.9 to 1495.9	✘
12	UL: 699 to 716	DL: 729 to 746	✔
13	UL: 777 to 787	DL: 746 to 756	✔
14	UL: 788 to 798	DL: 758 to 768	✔
17	UL: 704 to 716	DL: 734 to 746 (LTE only)	✔
18	UL: 815 to 830	DL: 860 to 875 (LET only)	✔
19	UL: 830 to 845	DL: 875 to 890	✔
20	UL: 832 to 862	DL: 791 to 821	✔
21	UL: 1447.9 to 1462.9	DL: 1495.9 to 1510.9	✘
22	UL: 3410 to 3490	DL: 3510 to 3590	✘
23	UL:2000 to 2020	DL: 2180 to 2200 (LTE only)	✔
24	UL:1625.5 to 1660.5	DL: 1525 to 1559 (LTE only)	✔
25	UL: 1850 to 1915	DL: 1930 to 1995	✔
26	UL: 814 to 849	DL: 859 to 894	✔
27	UL: 807 to 824	DL: 852 to 869 (LTE only)	✔
28	UL: 703 to 748	DL: 758 to 803 (LTE only)	✔
29	UL: -	DL: 717 to 728 (LTE only)	✔
30	UL: 2305 to 2315	DL: 2350 to 2360 (LTE only)	✔
31	UL: 452.5 to 457.5	DL: 462.5 to 467.5 (LTE only)	✘
32	UL: -	DL: 1452 - 1496	✘
35	1850 to 1910		✔
38	2570 to 2620		✔
39	1880 to 1920		✔
40	2300 to 2400		✔
41	2496 to 2690		✔
42	3400 to 3600		✘
43	3600 to 3800		✘

3. Antenna Characteristics

3.1 Return Loss



3.2 Peak Gain

ANT-DB1-LCD-ccc

Data Sheet

Product Description

The Linx LCD Dipole Antenna is a superior solution for users searching for best-in-class performance for WLAN devices using Dual-Band WiFi (802.11ac, 802.11n, 802.11ax) or U-NII applications.

With a compact package and low price, the LCD's high peak gain and superior efficiency make it an excellent option for high volume, cost sensitive applications.

Dipole design means that no additional ground plane is required.

Features

- Excellent performance
- Dual-band
- Very low VSWR
- Omni-directional pattern
- Tilt and swivel base
- Standard SMA or Part 15 compliant RP-SMA connector

Ordering Information

ANT-DB1-LCD-RPS (with RP-SMA connector)
ANT-DB1-LCD-SMA (with SMA connector)

Electrical Specifications

Parameter			
Recommended Frequency Range	2.4GHz WiFi	U-NII	5.8GHz WiFi/ U-NII-3 Band
	2.4 – 2.5GHz	5.125 – 5.725GHz	5.725 – 5.875GHz
VSWR	<2:1	<2:1	<2:1
Peak Gain (max in the band)	2.6dBi	4.5dBi	2.92dBi
Average Gain (typical)	-0.6dBi	-1.5dBi	-2.2dBi
Efficiency (typical)	85%	70%	65%
Polarization	Linear		
Radiation	Omni-Directional		
Max Power	10W		
Wavelength	1/2-wave		
Impedance	50-ohms		
Connection	SMA Plug (Male) or RPS (Reverse Polarity Male)		
Weight	7.4g (0.26oz)		
Operating Temperature Range	-40°C to +80°C		

Measurements taken on a 100 x 100mm ground plane, mounted on the edge, bent 90°

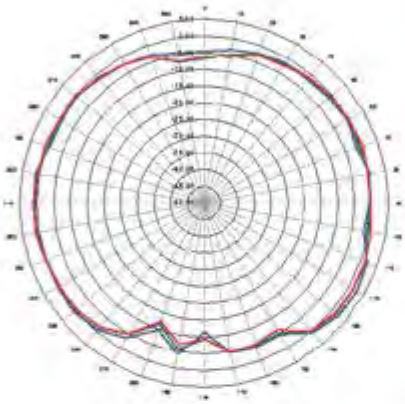
Gain Plots - Edge of Plane, Bent 90°

XZ Plane Gain

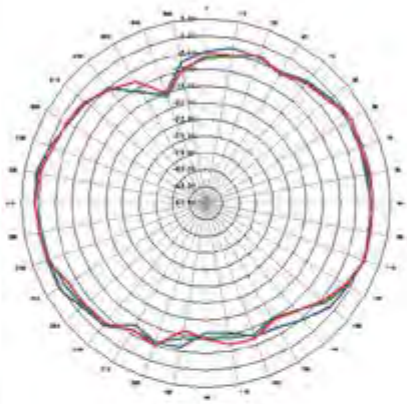
YZ Plane Gain

XY Plane Gain

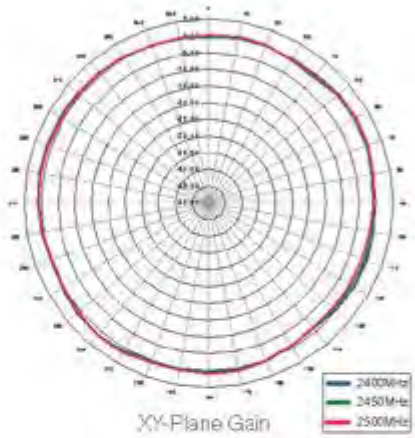
2400 - 2500MHz



XZ-Plane Gain

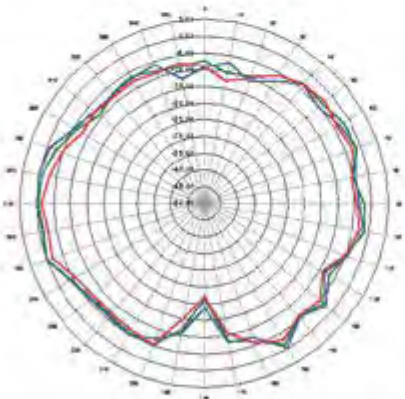


YZ-Plane Gain

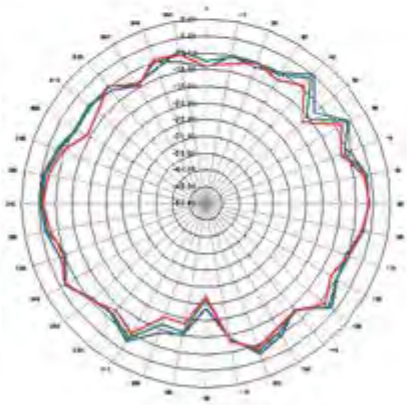


XY-Plane Gain

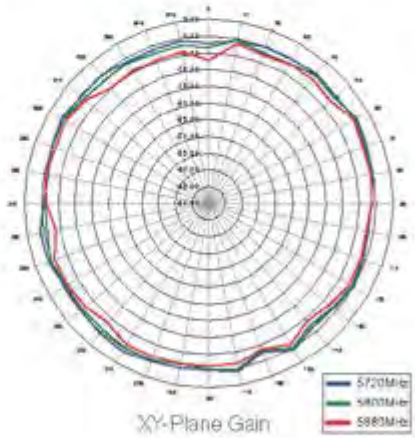
5720 - 5880MHz



XZ-Plane Gain

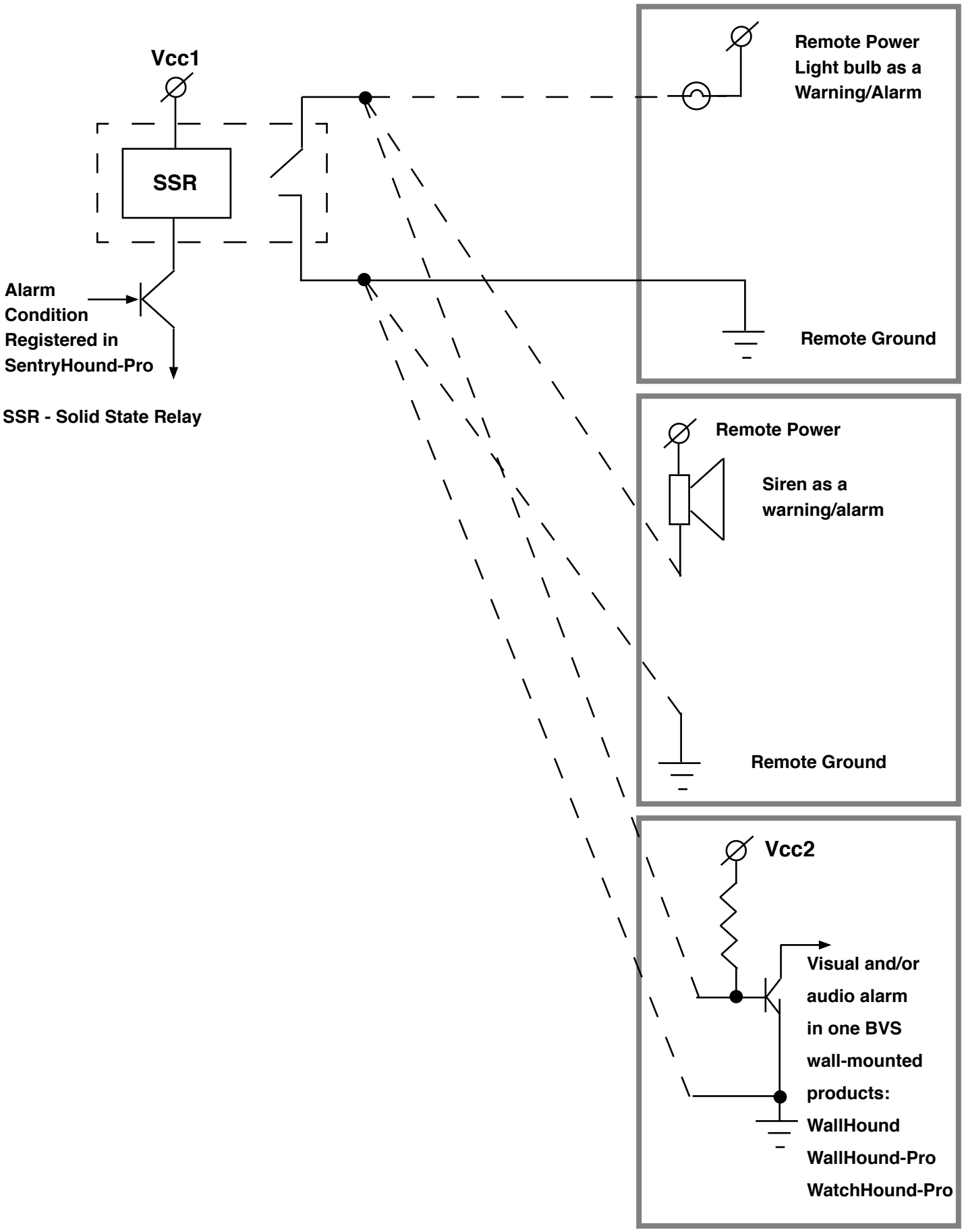


YZ-Plane Gain



XY-Plane Gain

Three examples of remote alarm triggered from a dry contact in your BVS product
(Similar outputs are provided in all wall-mounted BVS products)



IXYS
INTEGRATED CIRCUITS DIVISION

CPC1017N
60V Normally-Open Single-Pole 4-Pin SOP OptoMOS® Relay

Parameter	Rating	Units
Blocking Voltage	60	V_P
Load Current	100	mA_{rms} / mA_{DC}
On-Resistance (max)	16	Ω
LED Current to operate	1	mA

Features
- Designed for Use in Security Systems Complying with EN50130-4
- Only 1mA of LED Current Required to Operate
- 1500V_{rms} Input/Output Isolation
- High Reliability
- Arc-Free With No Snubbing Circuits
- No EMI/RFI Generation
- Immune to Radiated EM Fields
- Halogen Free
- Tape & Reel Version Available
- Small 4-Pin SOP Package
- Flammability Rating UL 94 V-0

Applications
- Security
  - Passive Infrared Detectors (PIR)
  - Data Signalling
  - Sensor Circuitry
- Instrumentation
  - Multiplexers
  - Data Acquisition
  - Electronic Switching
  - I/O Subsystems
- Meters (Watt-Hour, Water, Gas)
- Medical Equipment—Patient/Equipment Isolation
- Aerospace
- Industrial Controls

Description
The CPC1017N is a miniature single-pole, normally-open (1-Form-A) solid state relay in a 4-pin SOP package that employs optically coupled MOSFET technology to provide 1500V_{rms} of input to output isolation. The super-efficient MOSFET switches and photovoltaic die use IXYS Integrated Circuits Division's patented OptoMOS architecture while the optically coupled output is controlled by a highly efficient infrared LED.

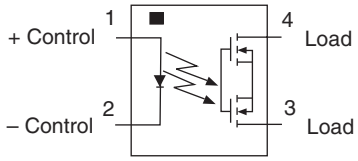
IXYS Integrated Circuits Division's state of the art double-molded vertical construction packaging enables CPC1017N to be one of the world's smallest relays. It offers board space savings of at least 20% over the competitor's larger 4-pin SOP relay.

Approvals
- UL Recognized Component: File E76270
- CSA Certified Component: Certificate 1172007
- EN/IEC 60950-1 Certified Component: Certificate B 13 12 82667 003

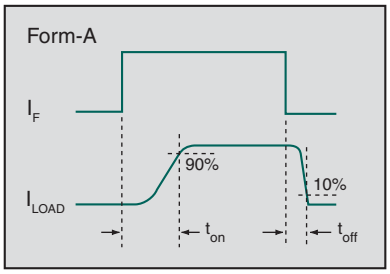
Ordering Information

Part #	Description
CPC1017N	4-Pin SOP (100/tube)
CPC1017NTR	4-Pin SOP (2000/reel)

Pin Configuration



Switching Characteristics of Normally-Open Devices



Absolute Maximum Ratings @ 25ºC

Parameter	Ratings	Units
Blocking Voltage	60	V_P
Reverse Input Voltage	5	V
Input Control Current	50	mA
Peak (10ms)	1	A
Input Power Dissipation	70	mW
Total Power Dissipation [1]	400	mW
Isolation Voltage, Input to Output	1500	V_{rms}
Operational Temperature	-40 to +85	ºC
Storage Temperature	-40 to +125	ºC

[1] Derate linearly 3.33 mW / ºC

Absolute Maximum Ratings are stress ratings. Stresses in excess of these ratings can cause permanent damage to the device. Functional operation of the device at conditions beyond those indicated in the operational sections of this data sheet is not implied.

Typical values are characteristic of the device at +25°C, and are the result of engineering evaluations. They are provided for information purposes only, and are not part of the manufacturing testing requirements.

Electrical Characteristics @ 25ºC

Parameter	Conditions	Symbol	Min	Typ	Max	Units
Output Characteristics						
Load Current						
Continuous [1]	I_F=2mA	I_L	-	-	100	mA_{rms} / mA_{DC}
Peak	t=10ms	I_{LPK}	-	-	±350	mA_P
On-Resistance [2]	I_L=100mA	R_{ON}	-	-	16	Ω
Off-State Leakage Current	V_L=60V_P	I_{LEAK}	-	-	1	µA
Switching Speeds						
Turn-On	I_F=5mA, V_L=10V	t_{on}	-	-	10	ms
Turn-Off		t_{off}	-	-	10	ms
Output Capacitance	I_F=0mA, V_L=50V, f=1MHz	C_{OUT}	-	5	-	pF
Input Characteristics						
Input Control Current to Activate [3]	I_L=100mA	I_F	-	0.4	1	mA
Input Control Current to Deactivate	-	I_F	0.3	-	-	mA
Input Voltage Drop	I_F=5mA	V_F	0.9	1.2	1.5	V
Reverse Input Current	V_R=5V	I_R	-	-	10	µA
Common Characteristics						
Capacitance, Input to Output	V_{IO}=0V, f=1MHz	C_{IO}	-	1	-	pF

[1] Load current derates linearly from 100mA @ 25ºC to 80mA @ 80ºC.
[2] Measurement taken within 1 second of on-time.
[3] For applications requiring high temperature operation (greater than 60ºC) a minimum LED drive current of 3mA is recommended.

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

Customer Support

Berkeley Varitronics Systems, Inc.
Liberty Corporate Park
255 Liberty Street
Metuchen, NJ 08840

8:00 AM to 6:00 PM EST
Toll Free: 888-737-4287
Phone: 732-548-3737
Fax: 732-548-3404

24/7 (expect a reply within one day)
email: support@bvsystems.com
www.bvsystems.com