

WallHound-Pro Wireless Detection and Deterrent Alert

User Manual Version 1.5



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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.

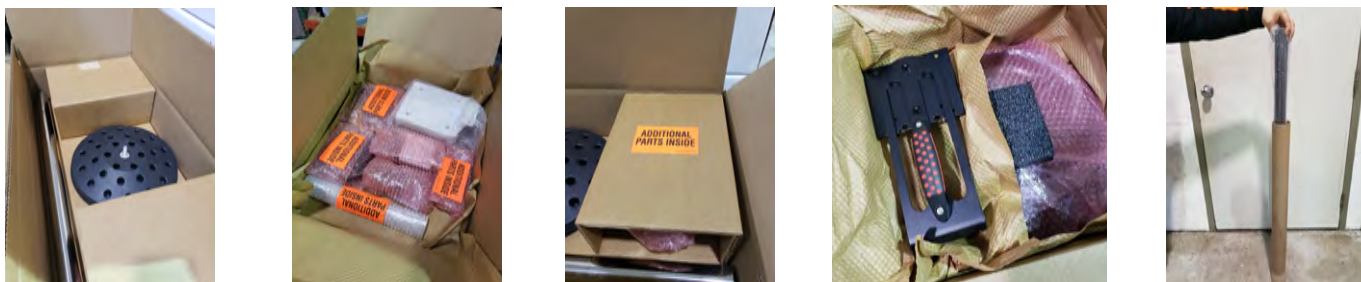
All parameters and adjustments are made only from WallHound-Pro's built-in touchscreen by designated security personnel including auto and manual thresholds, alert settings, international cellular bands and more. WallHound-Pro supports optional direction finding antennas allowing users to pinpoint specific 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 will arrive in this same box (18" x 23" x 11" (30 lbs)) but optional stanchion kit will arrive in (2) separate boxes.



WallHound-Pro optional stanchion mount ships in (2) separate boxes (14" x 14" x 6" (20 lbs)) and (37" x 3" x 3" (3 lbs))





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).



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.



Inhibits 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 inhibit.



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



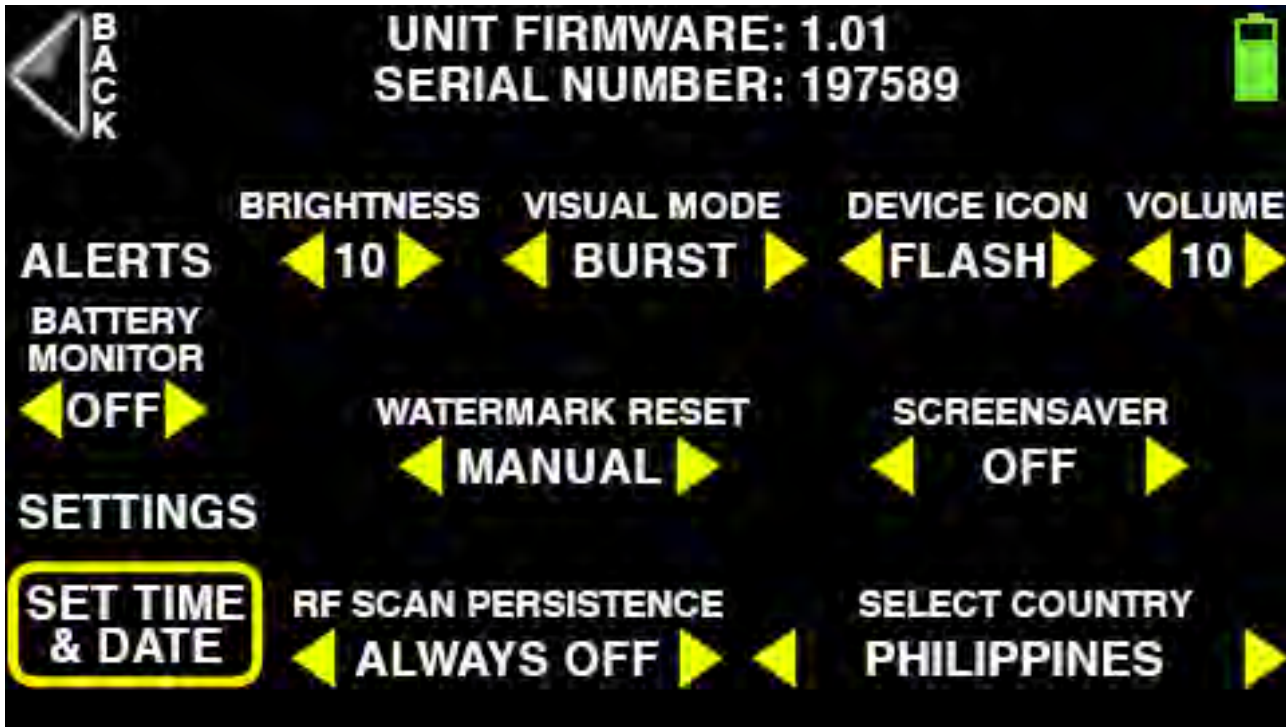
Toggles thresholds to be adjusted manually. This button will continue to blink while in manual mode allowing each signal's threshold to be manually adjusted.



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.



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: stealth, clock and off. Stealth simply shows nothing, clock shows the time of day and off does not enable the screensaver at all. Touch the BACK button to begin the screensaver of your choice and touch anywhere on the screen again to leave screensaver.



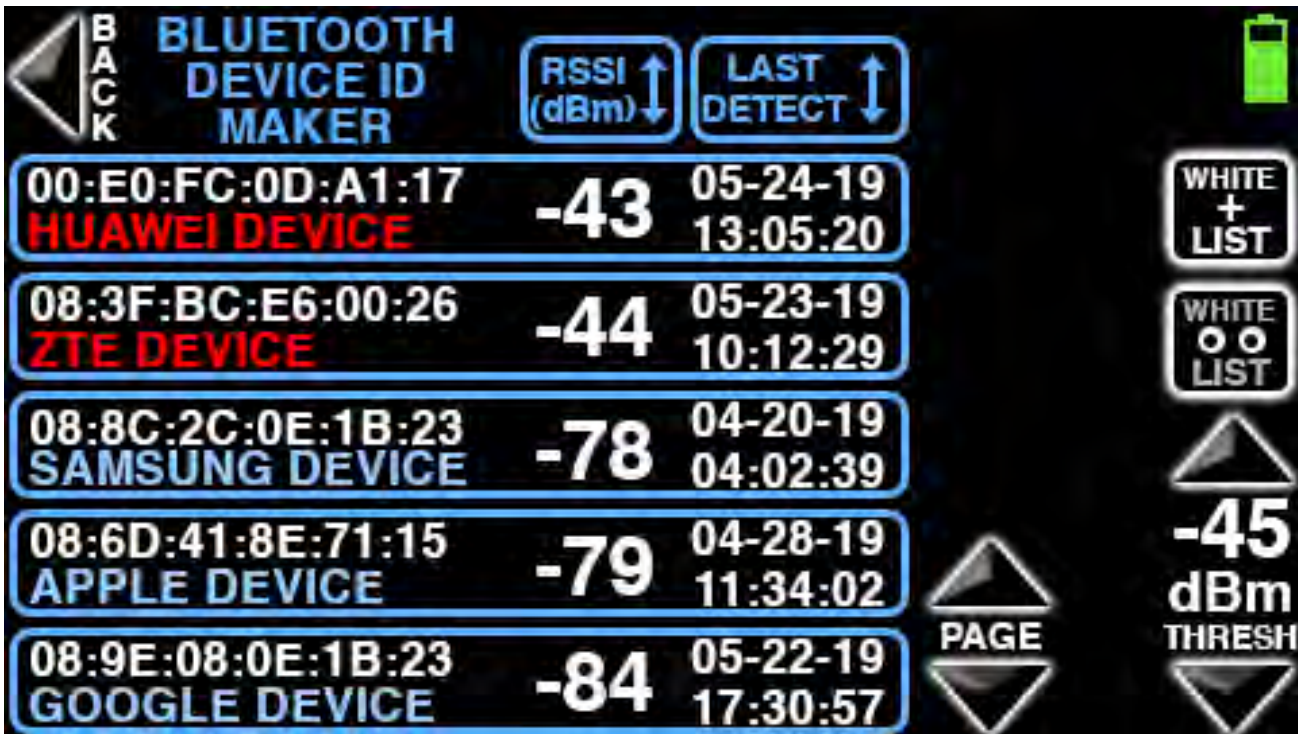
Set the time and date for both the screensaver clock mode and the timestamps of every measurement.



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 and COSTA RICA. 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.



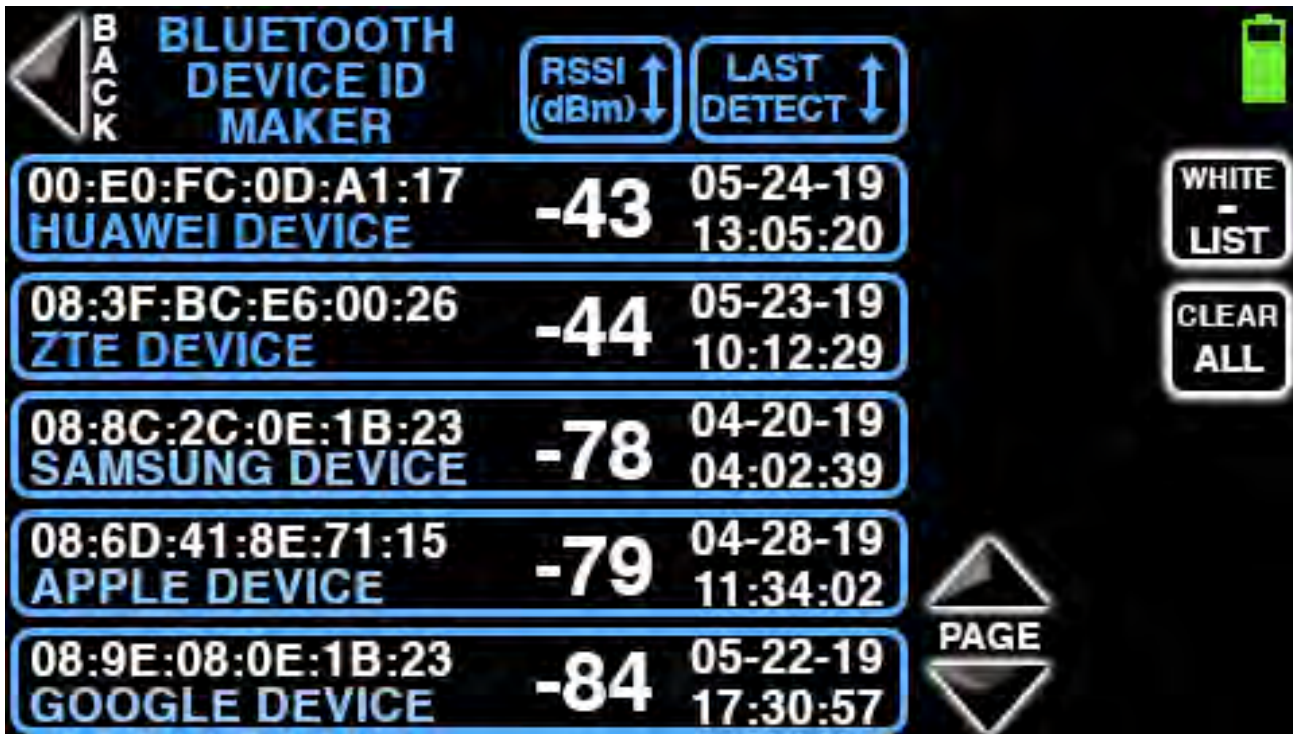
Press this button to add devices into the whitelist of known, friendly devices. So long as this button blinks you may add devices one by one. Press this button again when you are finished adding to the whitelist.



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.



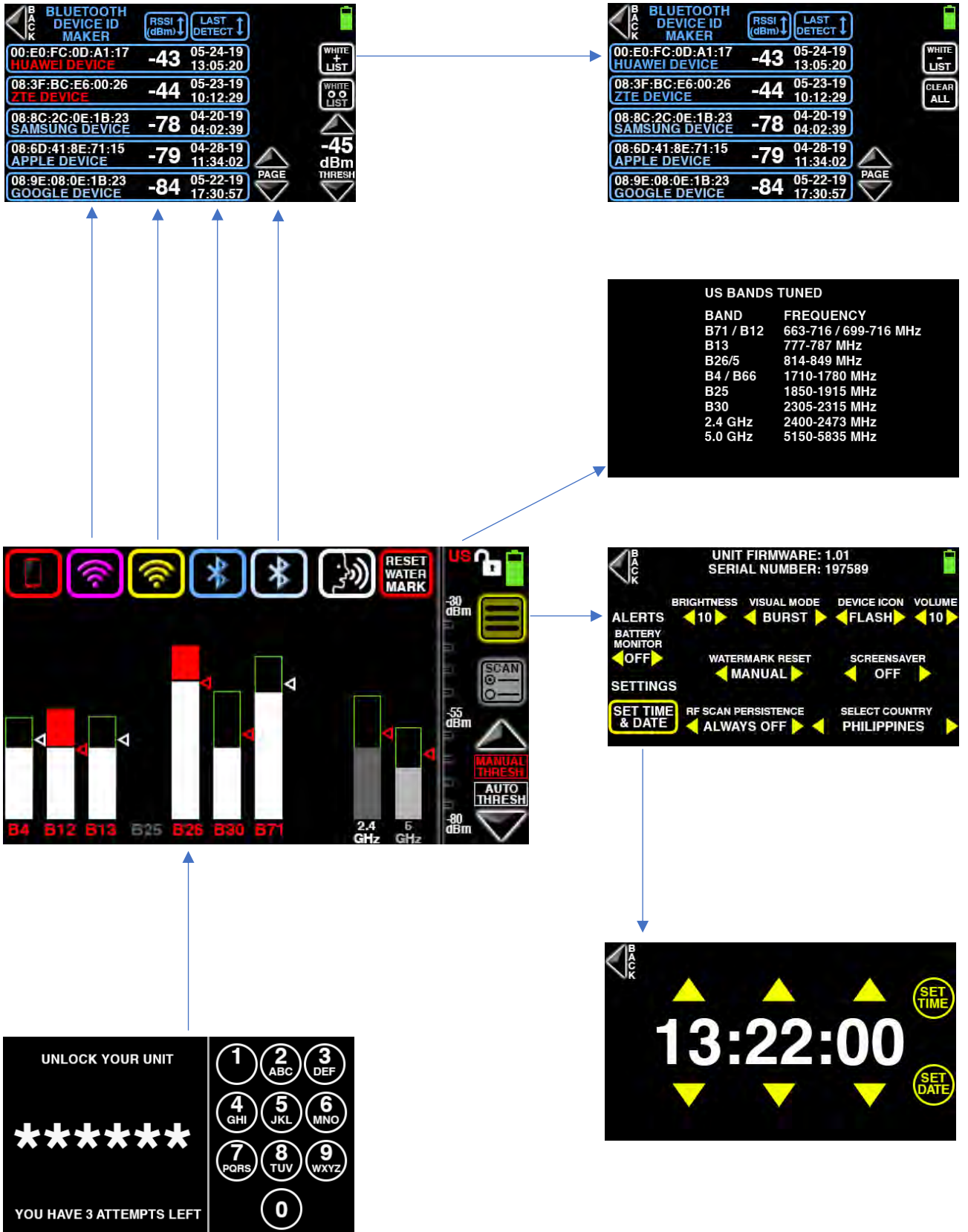
Remove whitelisted devices one by one from this whitelist and place them back into the Demodulated Device measurement list.



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

Certain companies such as Apple, Inc. use Wi-Fi MAC address randomization (turned off by default) to enhance privacy for users on their devices. This can create false triggers for device detections and alarms on BVS threat detection tools so it is strongly recommended that this feature be turned off on every device in range of a secure wireless area. If you are experiencing reliability issues with white listing, be sure to consult the device manufacturer's documentation to verify that all MAC address randomization privacy features are turned off.

WallHound-Pro Screens Flow Diagram



WallHound-Pro Hardware

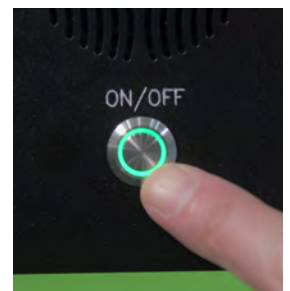


WallHound-Pro ships with everything you need to start securing your facility from wireless threats including a power supply, (3) omni-directional antennas, wall mounting hardware and (2) keys.

Optional hardware supported includes a portable stanchion mounting kit and directional antenna mounting kit.

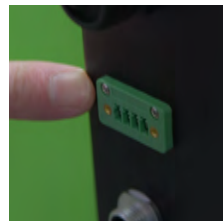


Use the included power transformer to both power and charge WallHound-Pro's internal backup battery. After securely connecting and tightening the connector, press the power button to turn on your unit. Be sure to provide AC power to your unit for several hours to fully charge the internal backup battery. Once charged, the backup battery allows WallHound-Pro to be disconnected from AC power and moved around without interruption of wireless detection.





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.



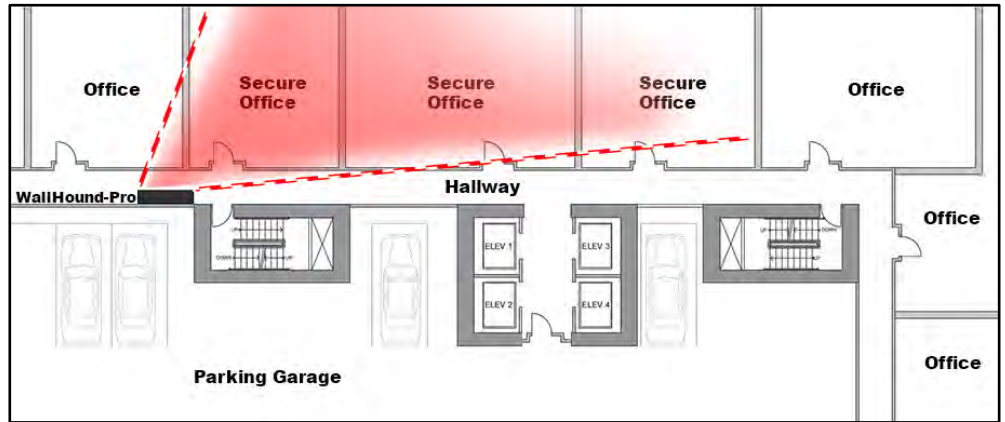
WallHound-Pro includes dry contacts allowing users to connect external alarms and recording devices upon wireless detection by WallHound-Pro. Consult this manual further down for a wiring diagram or contact your BVS sales or support representative for answers to questions.



WallHound-Pro includes a USB port for firmware updates. Contact your BVS support representative for firmware updating procedures to your unit.



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.



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.



Installation Instruction

Tools Needed for Assembly

Stud finder (for wood stud wall)
Pencil Mark
Electric drill

Drill bit (for wood stud wall)
Masonry drill bit (for concrete wall)
Ratchet with 7/16 inch socket

Measuring tape
Phillips screwdriver
Level

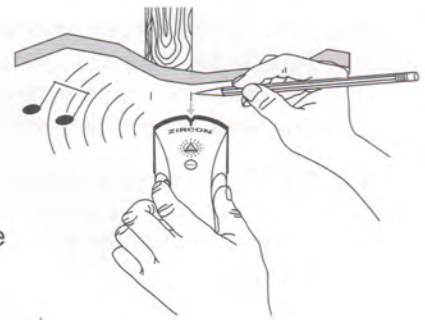
Use a qualified professional to properly install. VideoSecu not liable for the improper use or installation of its products. Common hardware provided. Installers are responsible to provide additional hardwares. The TV must not exceed 66 lbs, which is the maximum weight capacity of the bracket.

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.

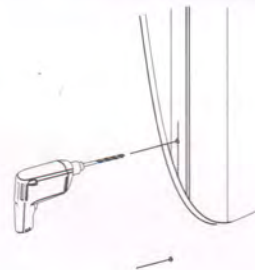
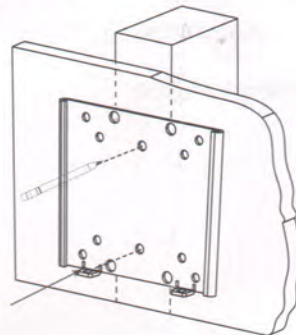
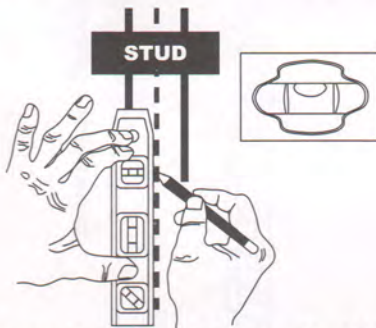
- 1-1. Using a stud finder make marks at the edges of the stud
- 1-2. Using level mark the centerline of the stud.



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.

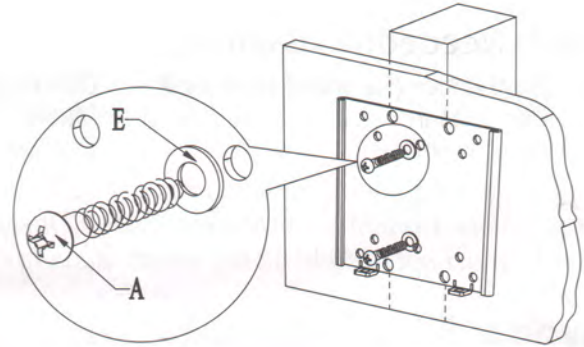
Step 2. Install Anchors

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

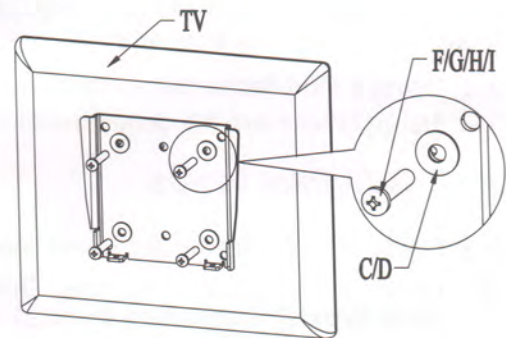
Using the provided lag bolts, tighten each bolt with an open ended socket wrench. Do not use power drill and do not over tighten the lag bolts

Please note that the forearm should be on the top.



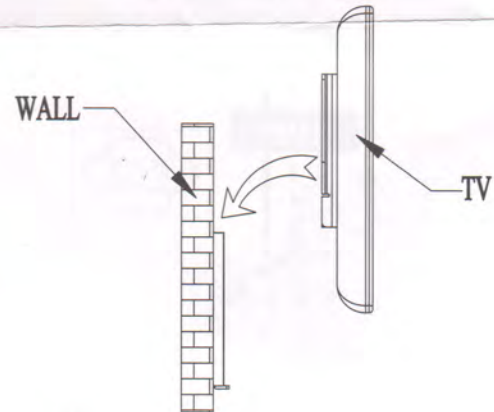
Step 4. Attach TV or monitor to the TV plate

- 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 expose the 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.



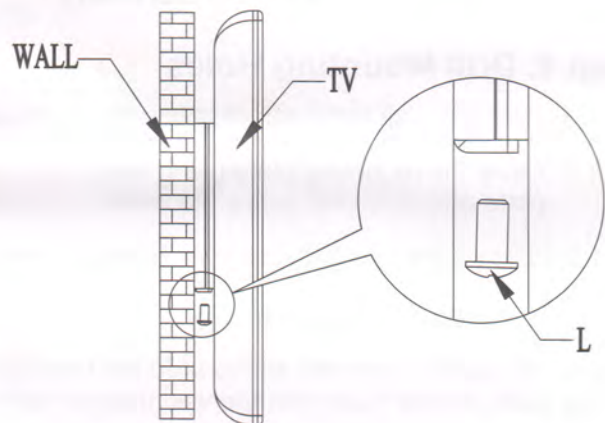
Step 5. Hang the Screen on the Wall Plate

- 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.

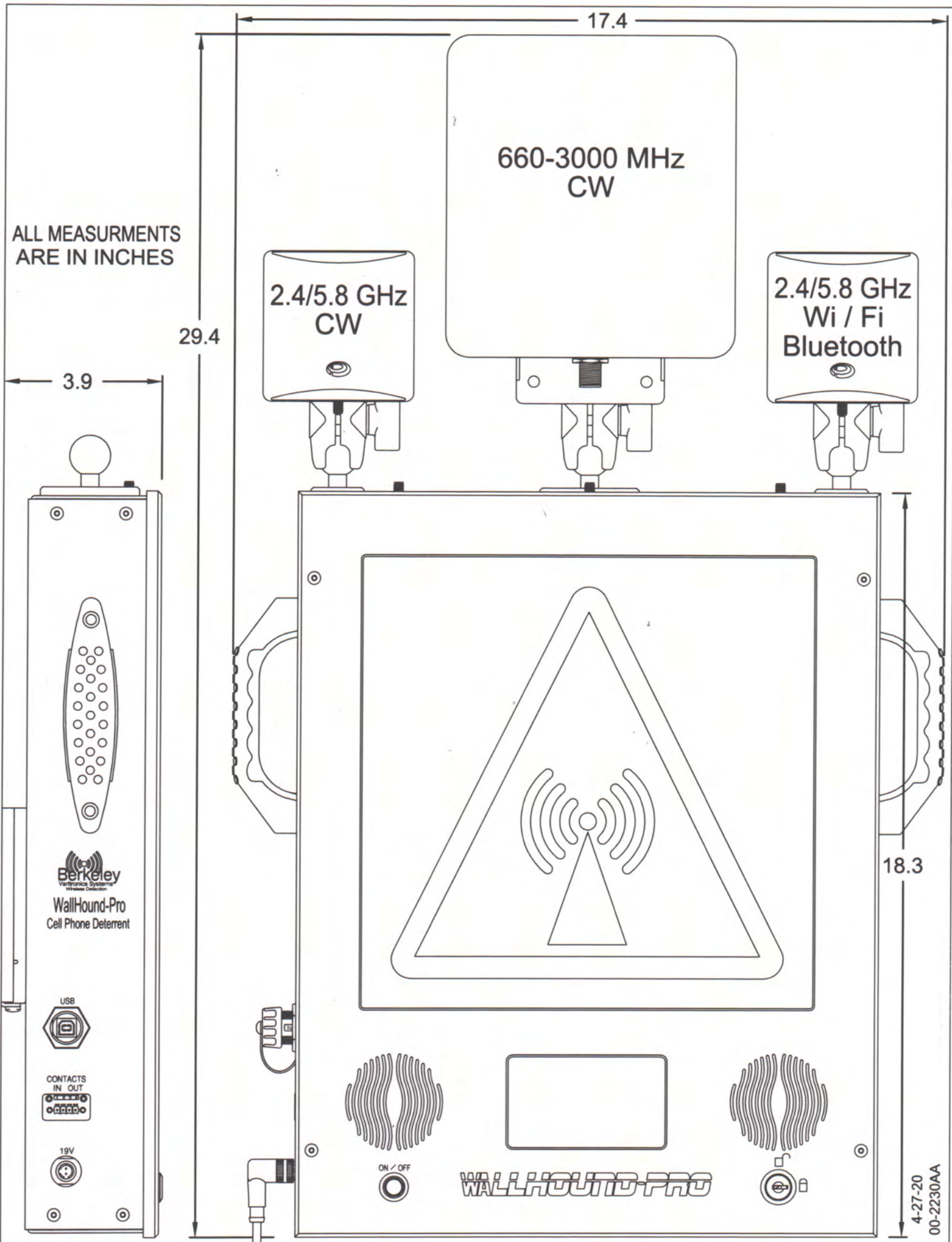


Step 6. Tighten Both Security Screws

- 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.

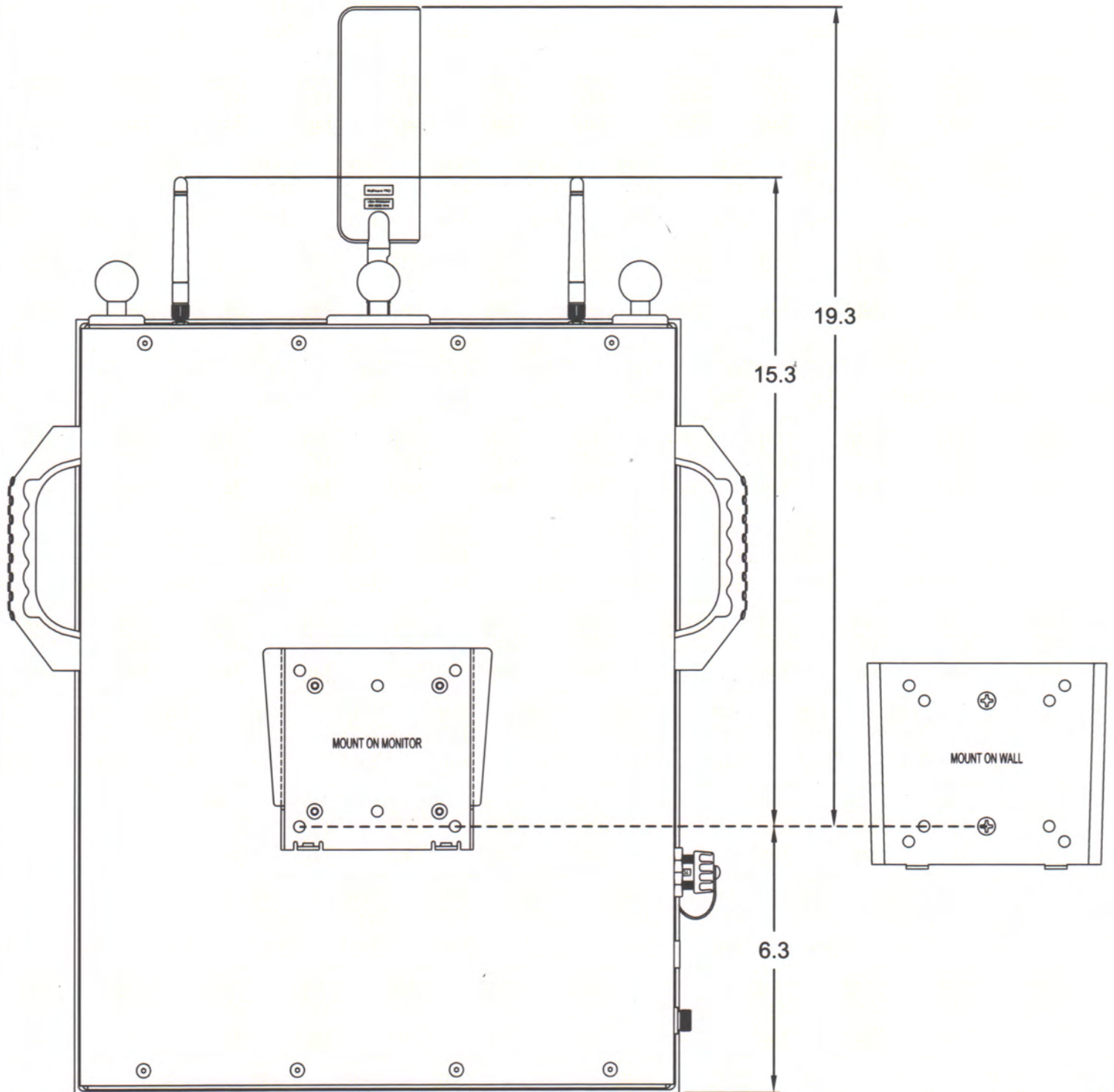


ALL MEASUREMENTS
ARE IN INCHES

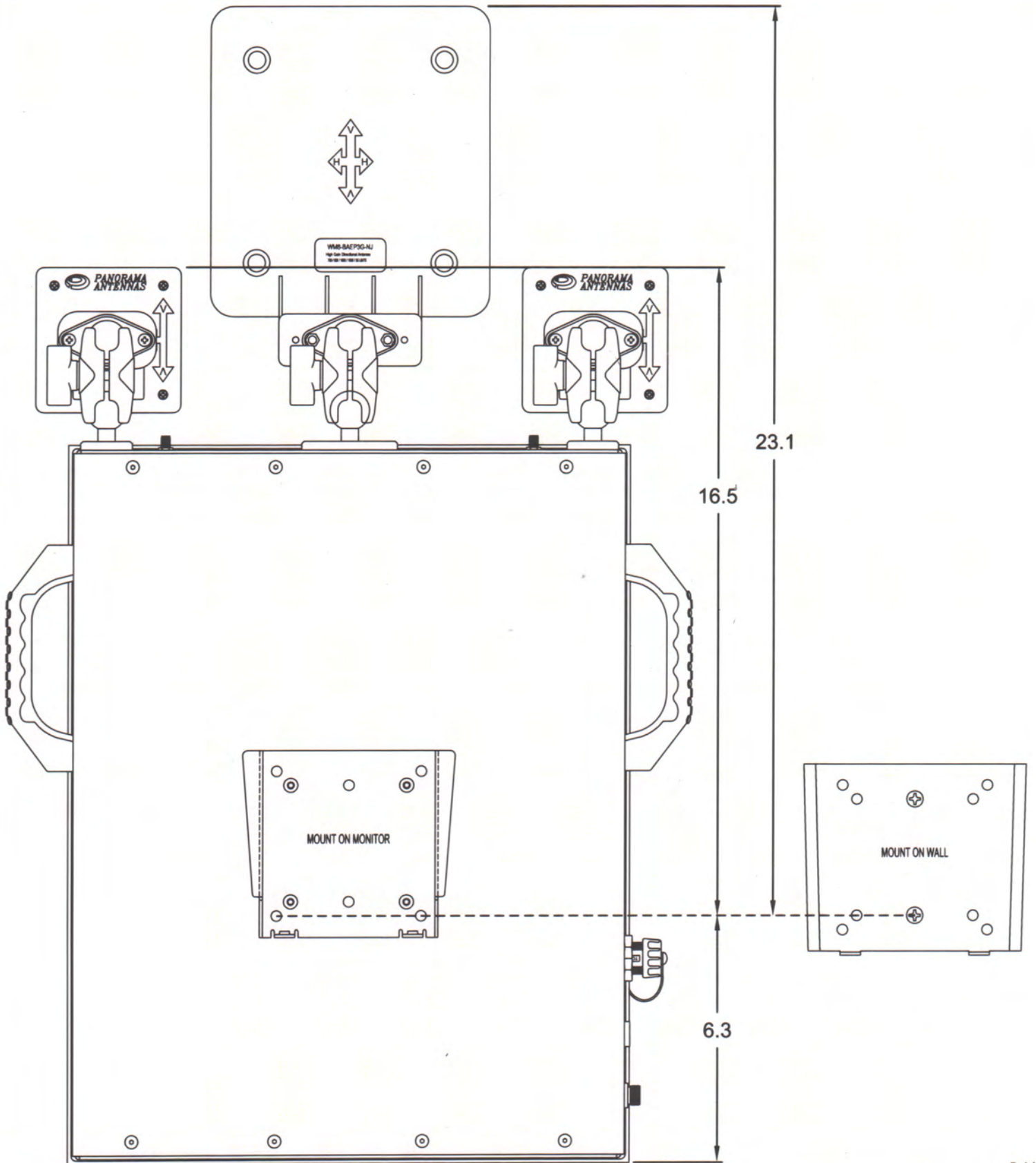


4-27-20
00-2230AA

REAR VIEW
OMNI DIRECTIONAL ANTENNAS
ALL MEASUREMENTS ARE IN INCHES



REAR VIEW
DIRECTIONAL ANTENNAS
ALL MEASUREMENTS ARE IN INCHES



ALL MEASUREMENTS
ARE IN INCHES

3.9

25.6

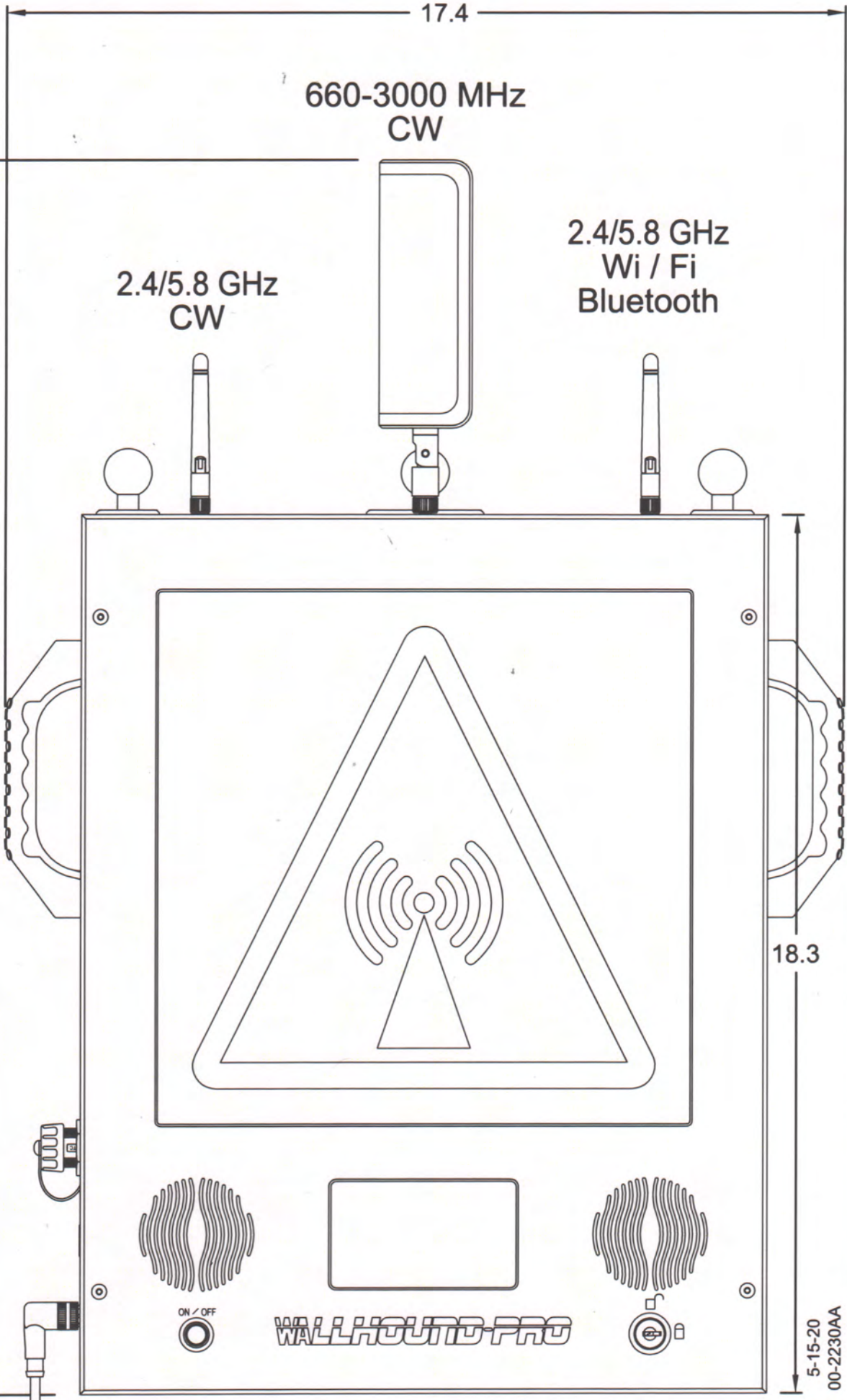
17.4

660-3000 MHz
CW

2.4/5.8 GHz
CW

2.4/5.8 GHz
Wi / Fi
Bluetooth

18.3



5-15-20
00-2230AA

W24-58-CP-9

M2M / WLAN

18/07/2014



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

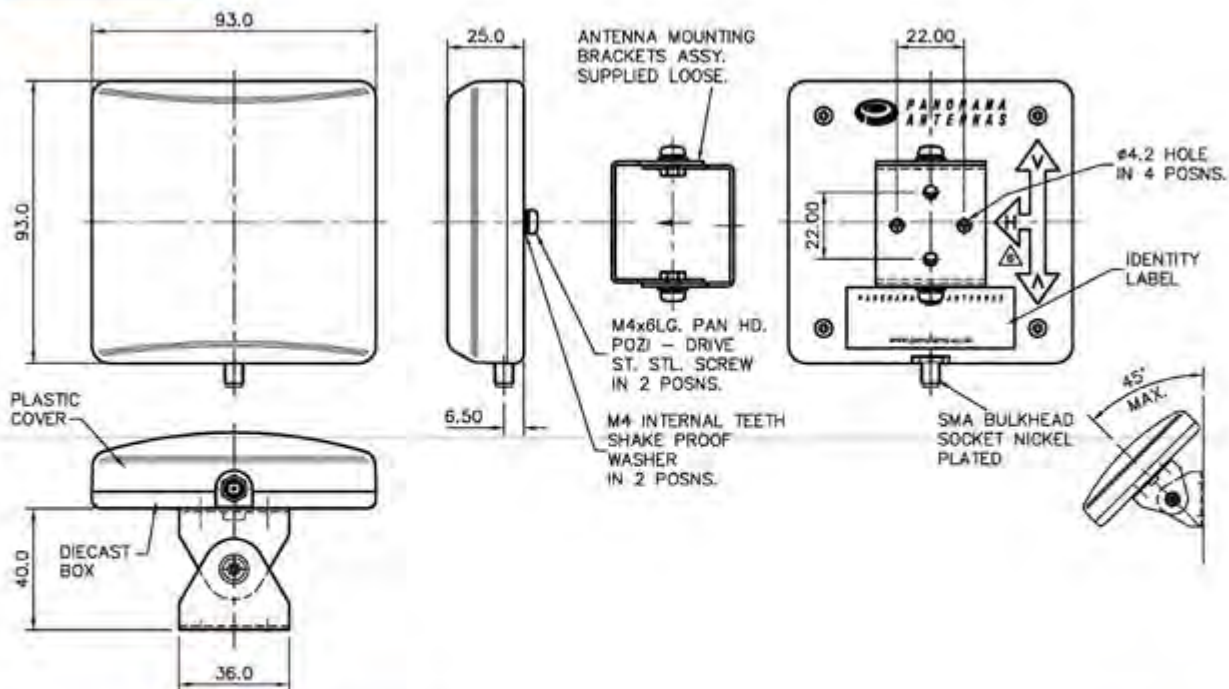
The Panorama client patch antenna is a directional wall or mast mounted antenna covering 2.4 & 5GHz for WIFI / WLAN applications.

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 sectorised 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

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www.panorama-antennas.com

Waiver: The data given above is indicative of the performance of the product/s under particular conditions and does not imply a guarantee of performance. These specifications are subject to change without notice.

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WM8-BADEP3G-26-NJ

High gain

Mast mount or wall mount

Low PIM & SAR tested to ENS0385:2002

Integrate wireless services into one antenna



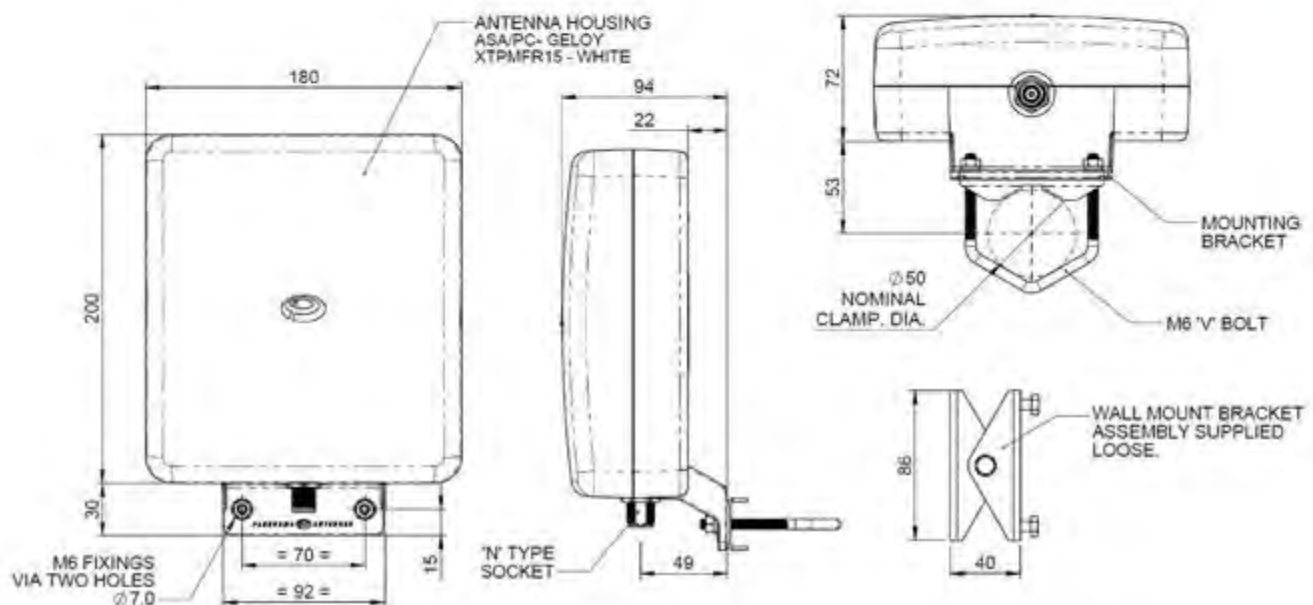
A versatile high gain directional antenna for in building applications, Panorama's WM8 range allows businesses and facilities to support multi-service/multi-operator wireless coverage. The WM8-BADEP3G-26-NJ supports 2G, 3G, 3G+ and 4G technologies including LTE, AMPS, PCS, GSM, UMTS & AWS with lower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



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

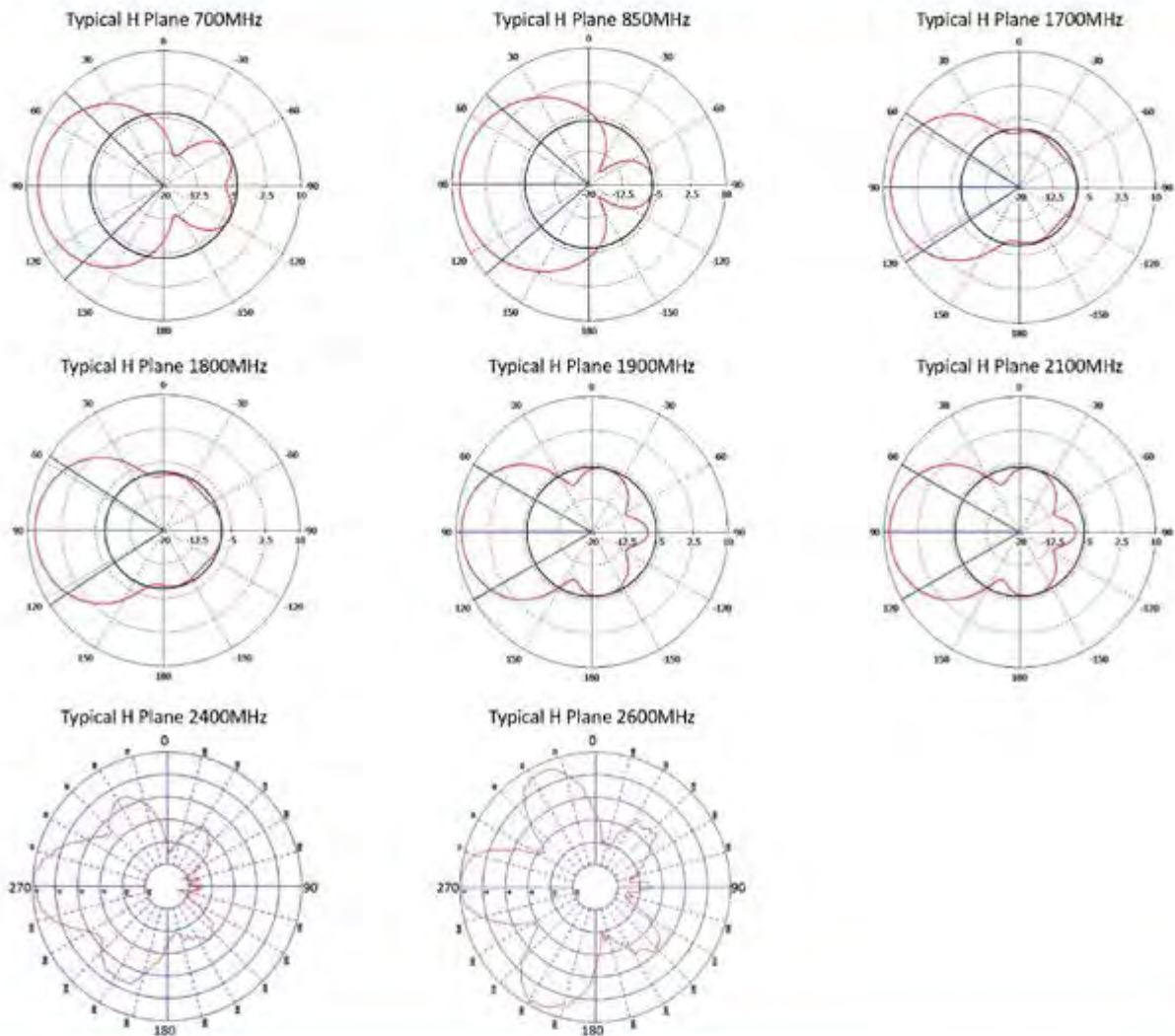
Technical Drawing



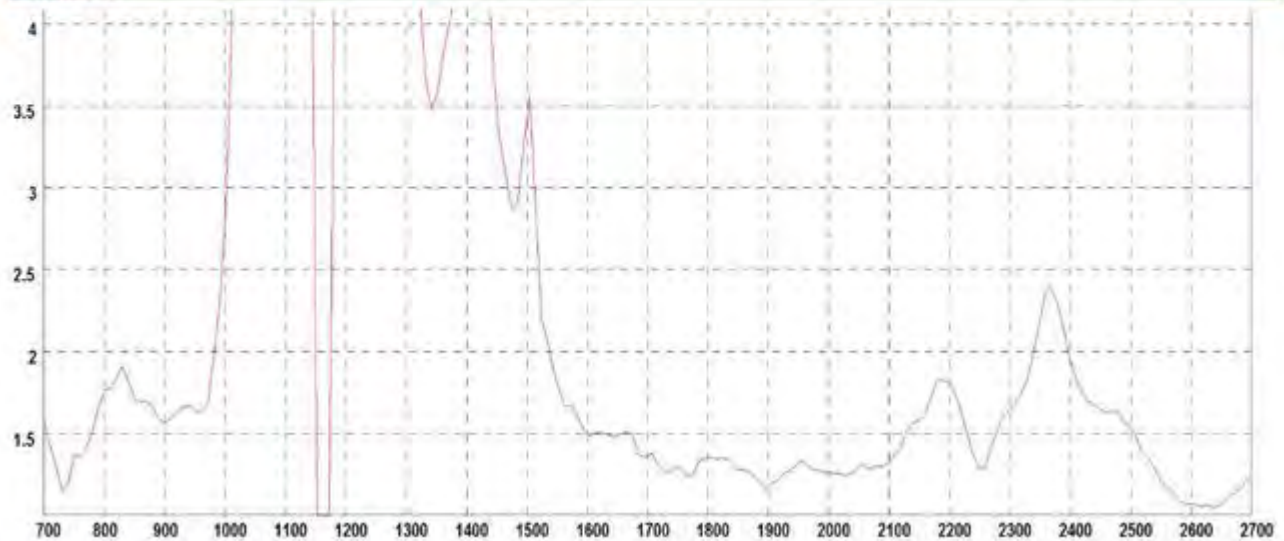
In Building Antennas

Low PIM Directional Antenna

Polar radiation plots



Typical VSWR



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

In Building

Low PIM Directional Antenna

Part No.		WVR-BA2E73G-25-NJ
Electrical Data		
Frequency Range (MHz)		698-960, 1710-2700
Operational band		LTE 700, AAWS 850, CDMA 800, GSM1900, PCS1900, 3G UMTS, AWS, WiFi, LTE 2.6
Peak Gain: dBi	LTE 700MHz, AAWS 850 & CDMA 800	6.5dBi
	GSM 1900, PCS 1900, 3G UMTS / AWS 2100	3dBi
	WiFi 2400, LTE 2600	5dBi
VSWR		<2.5:1
Polarisation		Vertical
Pattern		Directional
Typical Passive Intermod. (2x20dB, 3rd ord.) dBc ²		-140
SAR and "Touch Safe" Test Data		According to 50385:2002 (Bands: 850, 700, 1900, 2100, 2600MHz)
Impedance		50Ω
Max Input Power (W)		50
Mechanical Data		
Dimensions (mm)	Height	230mm (9.05")
	Width	180mm (7.08")
	Length	34mm (1.34")
Operating Temp (°C)		30°F / 17°C (-22° / 150°F)
Material		PC/PSA
Colour		White
Connector Data		
Type		N Socket
Mounting Data		
Fixing		Pole Mount / Wall Mount
Pole Diameter:		20-50 mm (0.8 - 1.96")

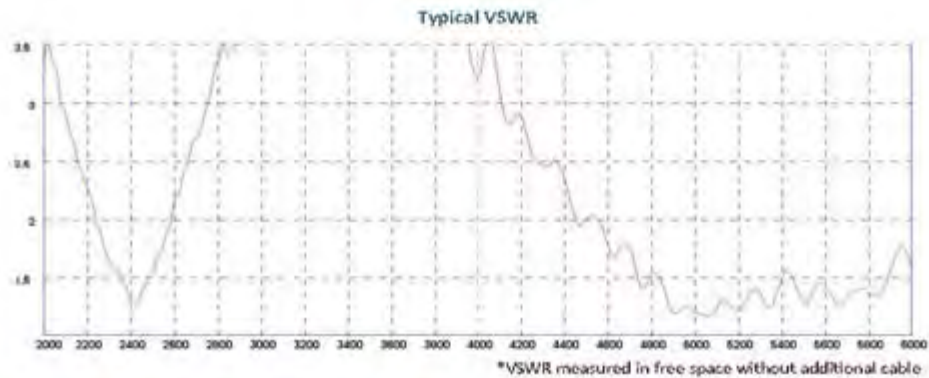
²Range PIM performance verified under controlled conditions by Anritsu PIM Master test equipment.

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www.panorama-antennas.com

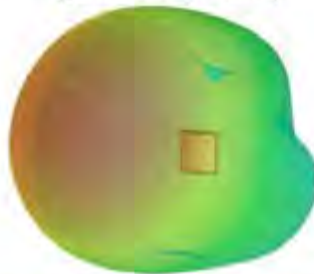
Waiver: The data given above is indicative of the performance of the product/s under particular conditions and does not imply a guarantee of performance or a warranty of fitness for any particular purpose. These specifications are subject to change without notice.
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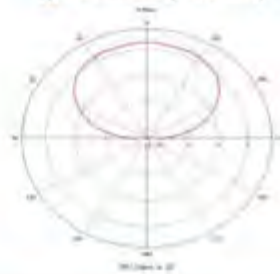
Typical H-Plane (2400MHz)



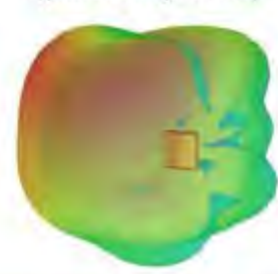
Typical 3D Plot (2400MHz)



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, 15/5.42MHz
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
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
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
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
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

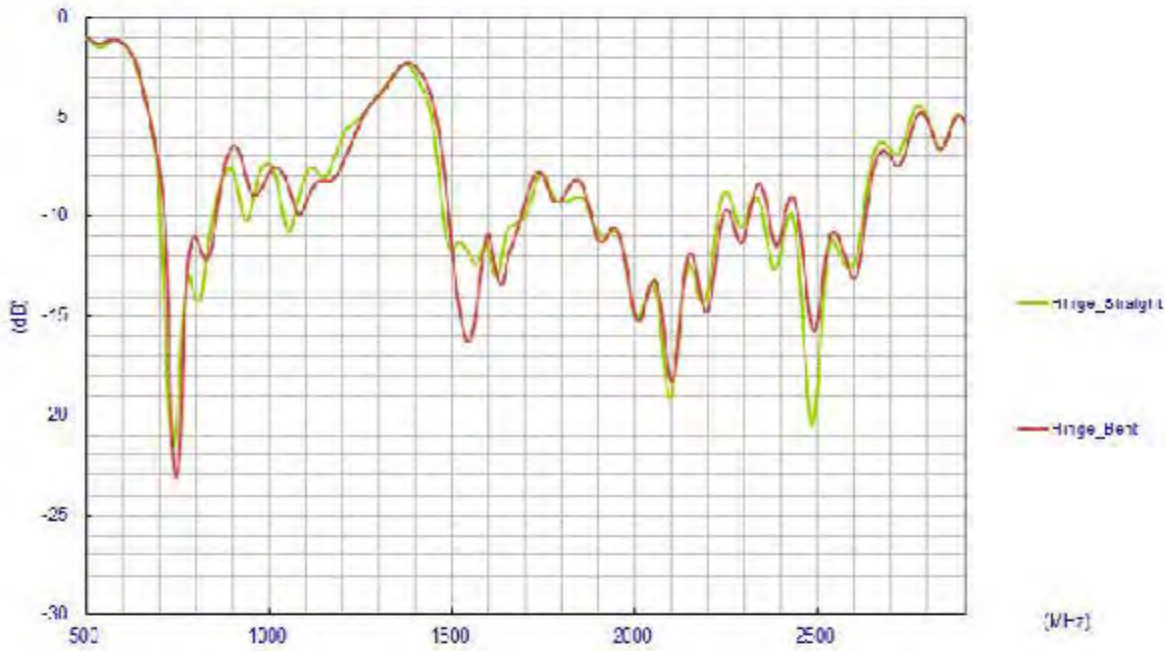


ELECTRICAL							
Frequency (MHz)	700~800	824~960	1575.42	1710 ~ 1880	1850 ~ 1990	1710 ~ 2170	2400~2800
Efficiency (%)							
Free Space Straight	79	61	63	71	76	75	45
Free Space Bent	78	60	70	72	78	75	49
30x30cm GP center Straight	86	69	62	66	67	68	42
30x30cm GP center Bent	47	32	51	58	66	64	51
30x30cm 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 (LTE 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	2.4GHz WiFi	U-NII	5.9GHz WiFi / U-NII-5 Band
Recommended Frequency Range	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)	2.8dBi	4.5dBi	2.92dBi
Average Gain (typical)	-0.8dBi	-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 100x100mm ground plane, mounted on the edge, bent 90°			

Gain Plots - Edge of Plane, Bent 90°



XZ Plane Gain

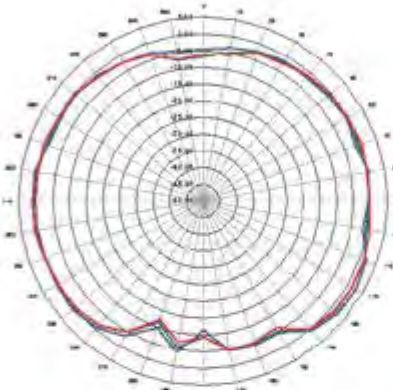


YZ Plane Gain

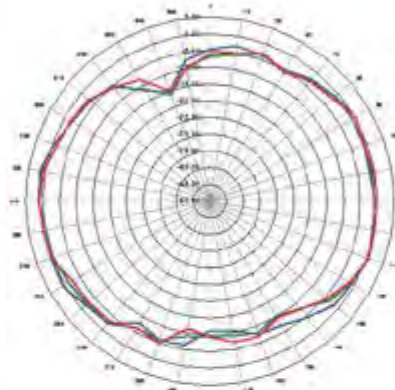


XY Plane Gain

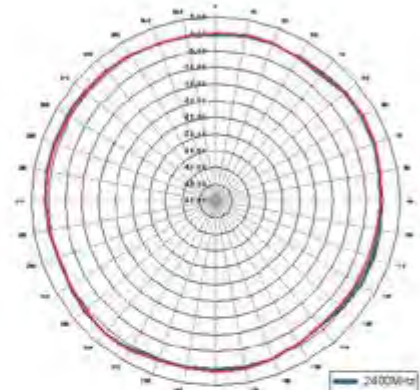
2400 - 2500MHz



XZ-Plane Gain



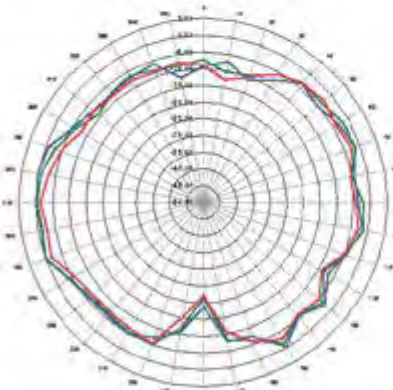
YZ-Plane Gain



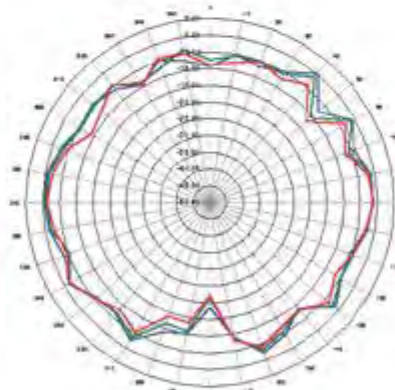
XY-Plane Gain



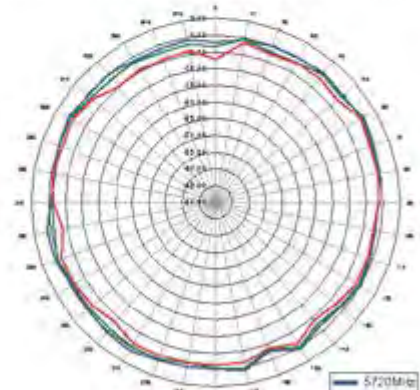
5720 - 5880MHz



XZ-Plane Gain



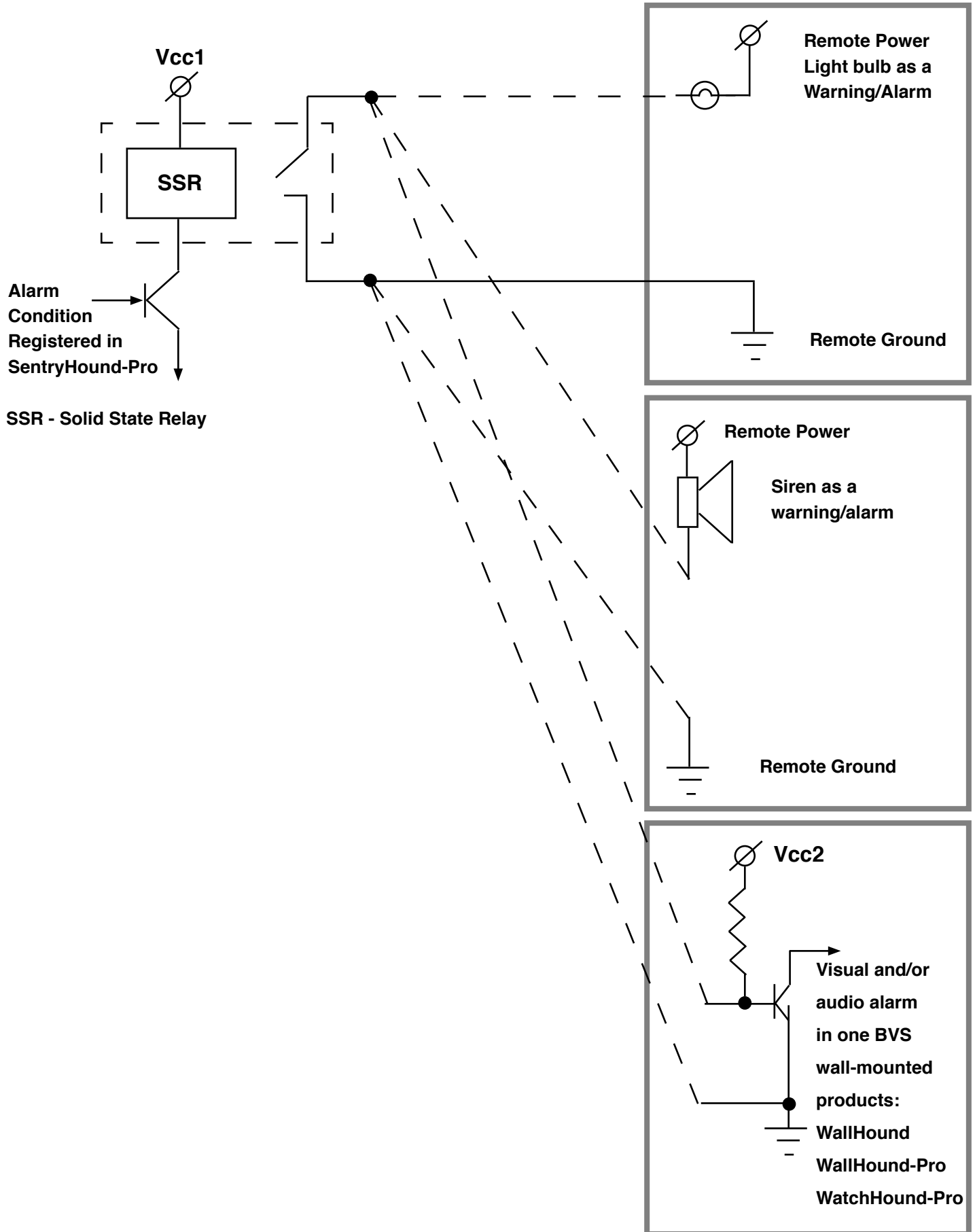
YZ-Plane Gain



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)**





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.

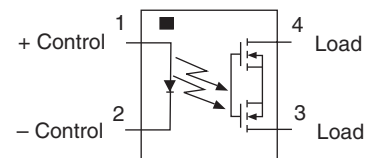
Approvals

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

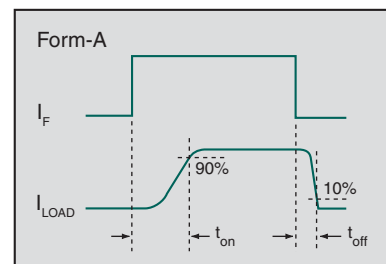
Ordering Information

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 @ 25°C

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	°C
Storage Temperature	-40 to +125	°C

¹ Derate linearly 3.33 mW / °C

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 @ 25°C

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 @ 25°C to 80mA @ 80°C.

² Measurement taken within 1 second of on-time.

³ For applications requiring high temperature operation (greater than 60°C) 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

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