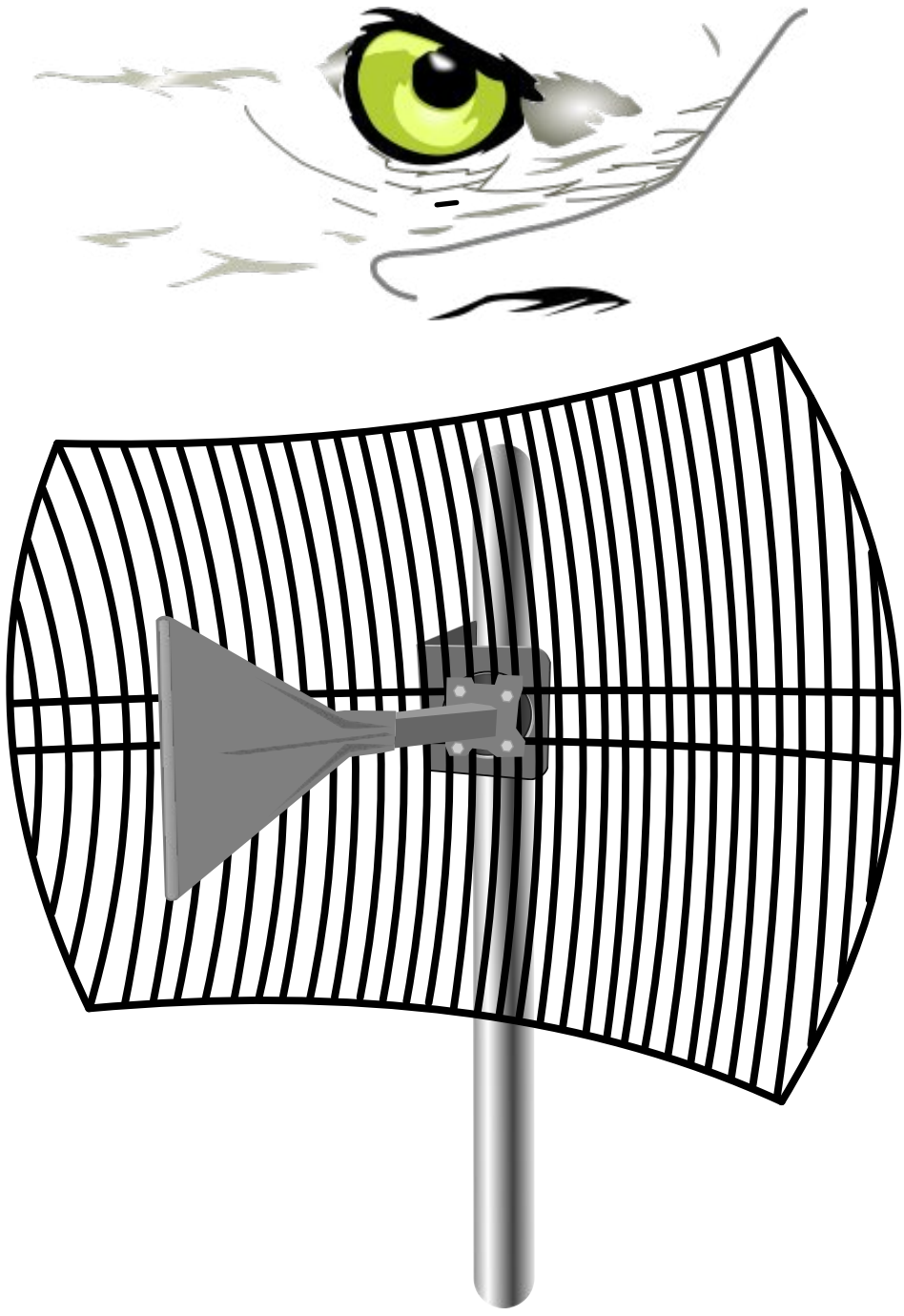
Proeye Communications

& Security Systems



Professionals Installers Specification

Enterprise Ultra Wide Band High Gain Grid Antenna

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Specifications

Feed element designed and Engineered by Antenna World in Miami Florida USA -- AUS Patent 2020204437 -- US Patent 10847892

Antenna Bracket designed and engineered by Proeye Communications & Security Systems. AUS Patent 2021106531

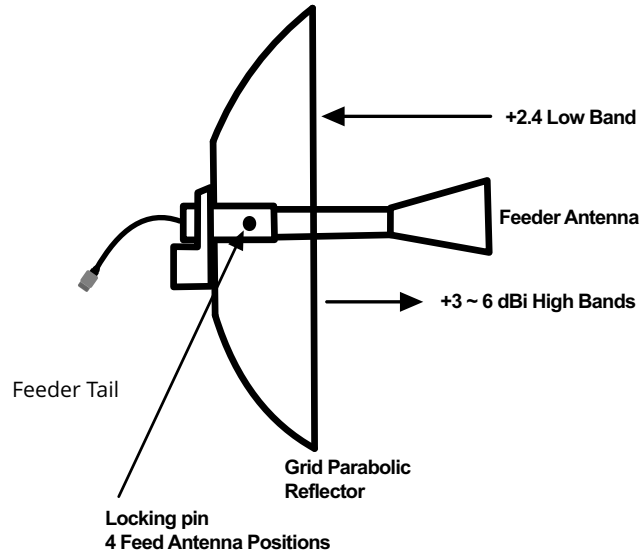
Components Sourced oversees and locally manufactured

Assembled from imported and locally sourced items

The Ultra Wide Band Grid Antenna (UWB Grid) presents high continuous gain, high directivity, across a broad frequency range in comparison to other antenna types.

Antenna applications and use examples:

- Land Mobile Radio, Point to Point / Point Multipoint
- Cellular GSM, 3G, 4G, 5G, ISM Bands
- WiFi, Wi-Max, GPS
- Military, Satellite, Aerospace
- Amateur Radio.



Specifications	
RF Electrical	
Frequency Range	Low 600-960MHz / Mid 1700-2700 / High 3000 - 6500MHz
Polarisation	Vertical / Horizontal / 45 Deg
Gain dBi	15 Low / 20 Mid / 23 High (Typical)
3dB Beam-width Low Band - Feeder set to Vert Pol	20 Degrees (+/- 10 Degrees)
3dB Beam-width Mid Band - Feeder set to Vert Pol	12 Degrees (+/- 6 Degrees)
3dB Beam-width High Band - Feeder set to Vert Pol	7 Degrees (+/- 3.5 Degrees)
Front to Back Ratio - Low ~ High Bands	18 ~ 24 dB AVG
Impedance	50 Ohm
VSWR	1.6:1 ~ 1.4:1 Typical
Max Input Power	100
Lightning Protection	DC Ground
Connector Type	N-Female / Available 4.3-10 on special order)
Mechnical	
Height	24" / 60mm
Width	39" / 990mm
Depth	16" / 400mm
Weight	5.3lb / 2.4 Kg
Packing Weight	7.2 lb / 3.3 Kg
Rated Wind Velocity	130 mph / 209 kmph
Wind Loading	150 M / 68 K
Mast Mounting Diameter	1.5~2" / 32 ~ 50mm
Reflector Material	Aluminium
Reflector Finish	Electrostatic Powder Coated
Radome Material	ASA UV Stabilised
L-Bracket and Articulating Rings	4mm Stainless Steel
Antenna System Colour	Grey
Water Resistance	IPX Weather Rated
Operating Temperature	-40 to 60 Celsius
Origin	Parts Sourced China/USA and AUS Manufacture

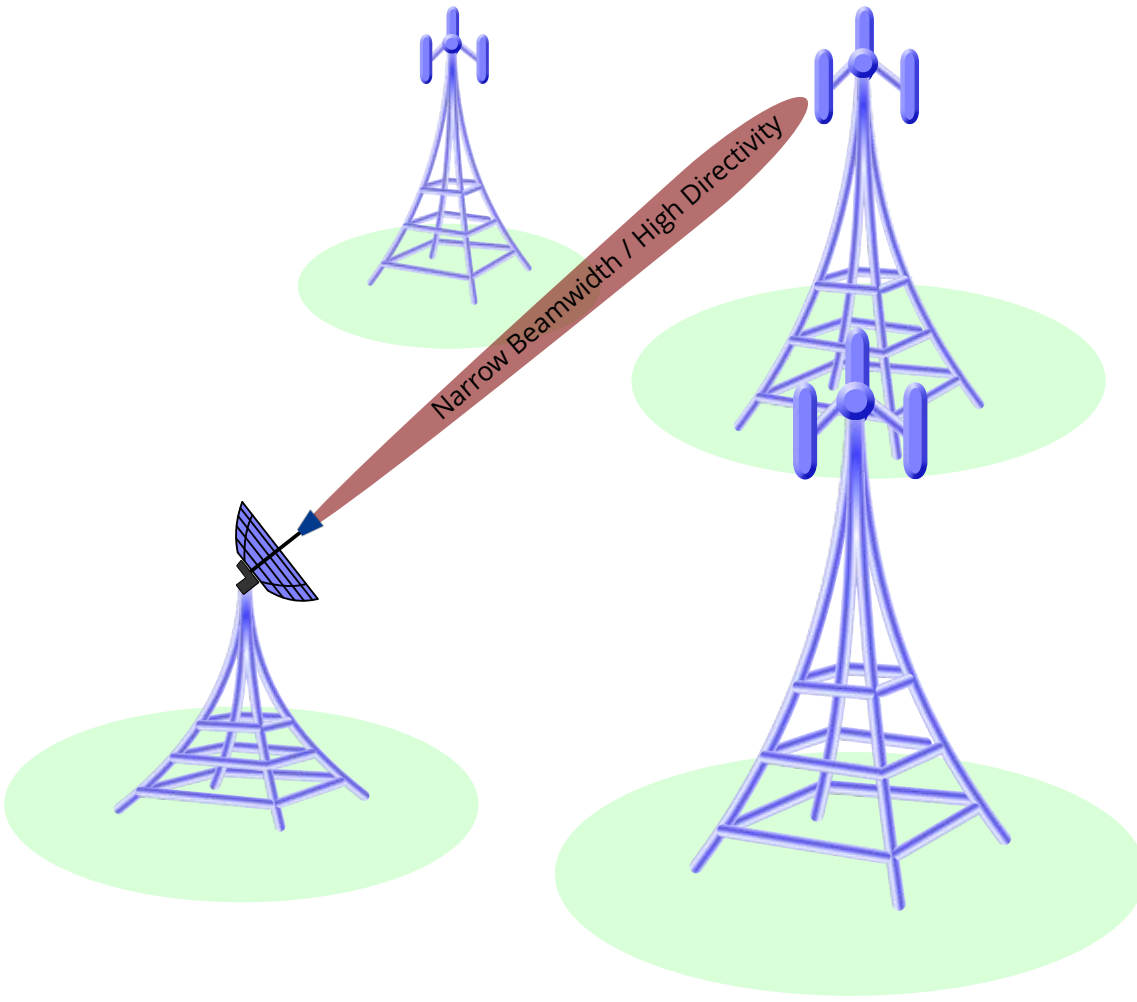
Features and Functions

Ultra Wide Band Frequency Range, High Gain, High Directivity, Narrow Beam-Width and Large Aperture

The antenna has a relativity high gain, 14~23dBi and narrow beam-width over a broad frequency range 600~6500MHz by combing broadband antenna feed into a parabolic reflector.

Features and functions:

- High level signal level and quality link
- High level signal dominance from subject antenna versus other surrounding antennas.
- Maximise throughput by improving signal quality
- Broad frequency range to support a multitude of Telecommunications technologies 2G,3G,4G,5G and beyond.
- Skew and match antenna polarity +45, -45, Vertical, Horizontal and other angles.
- Angle diagonally down or upward
- Large Aperture Antenna for improved signal capture and performance in Non Line of Site situations



Antenna Radiation Pattern

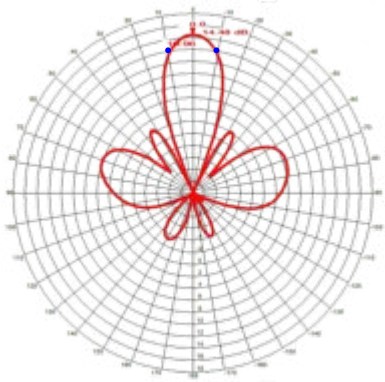
Assembled Antenna Example



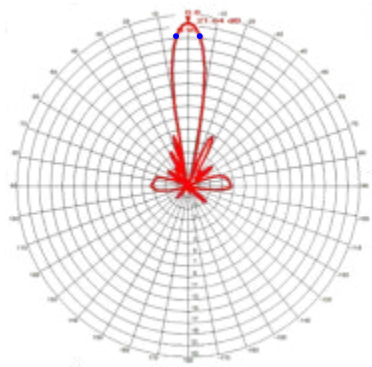




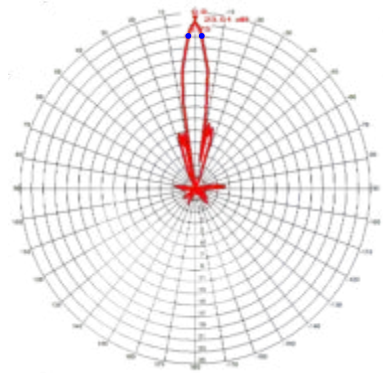
Low Band Vert Pol ~ 14dBi



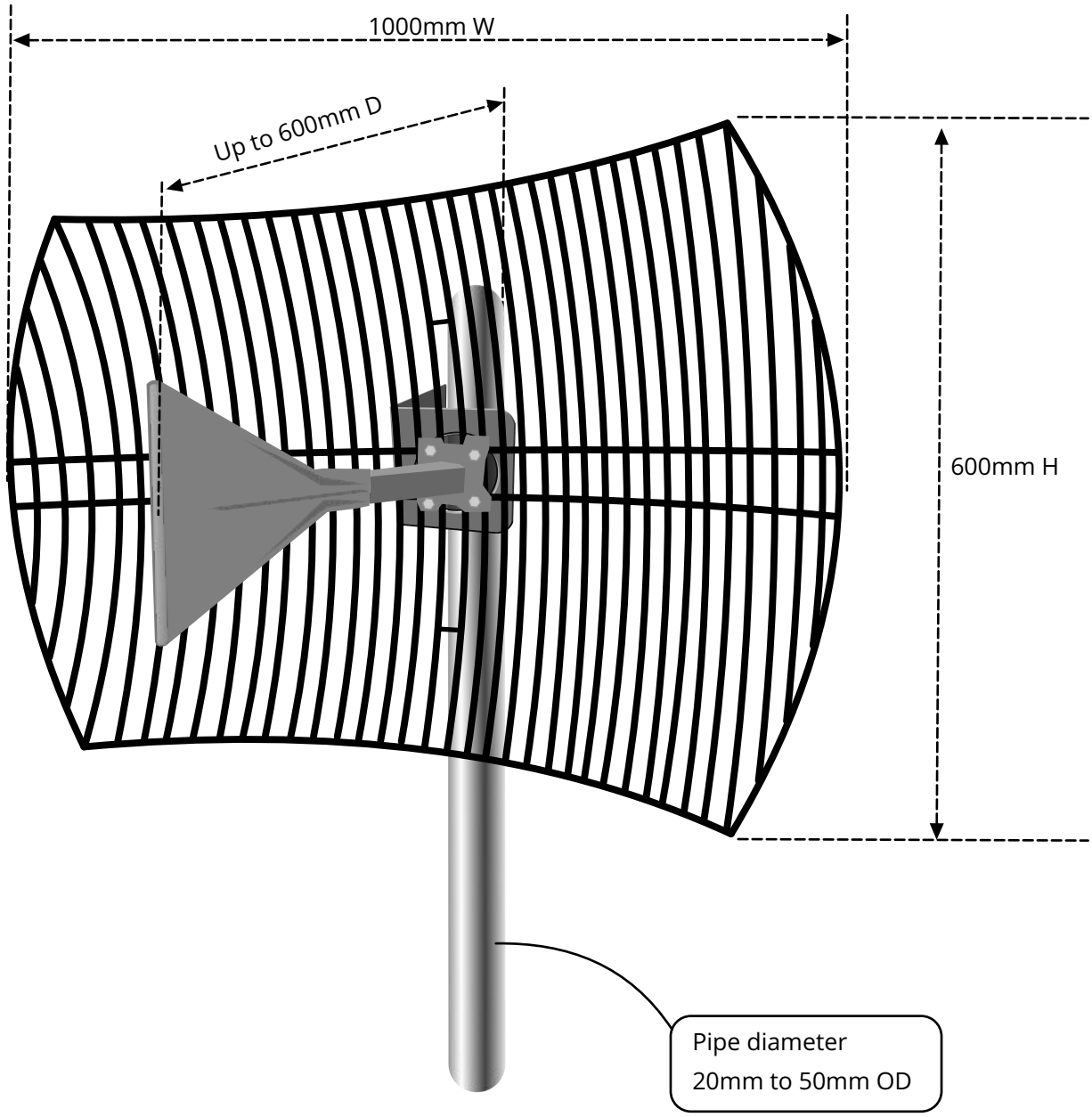
Mid Band Vert Pol ~ 21dBi



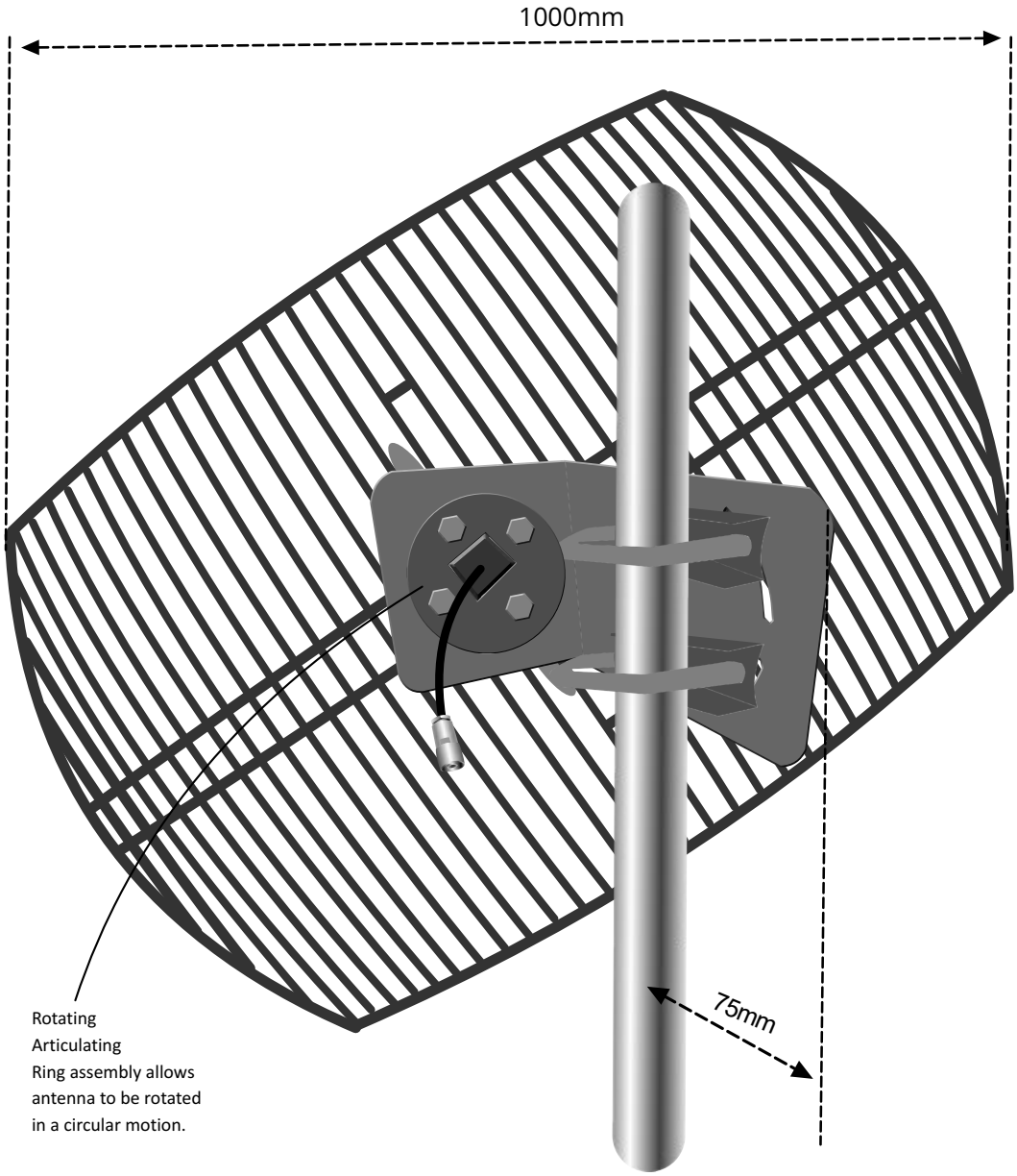
High Band Vert Pol ~ 23dBi



Antenna Dimensions - Front Facing



Antenna Dimensions - Rear Facing



Parts List

1 X LPDA Feeder Antenna and Feed Holder



4 X Cad Plated Steel Toothed Saddle Clamps



2 X Cad Plated U Bolts with 4 Nuts and 4 x Washers



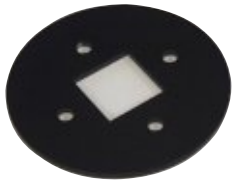
Articulating L Bracket



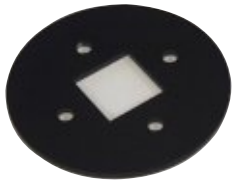


4 X Stainless Steel Small-Bolts Washers and Nuts

4 X Stainless Steel Long Bolts Washers and Nuts



2 X Large Articulating Rings



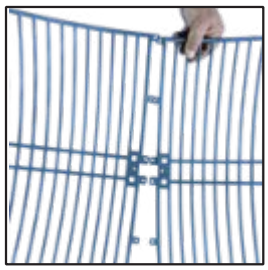


1 X Small Articulating Ring

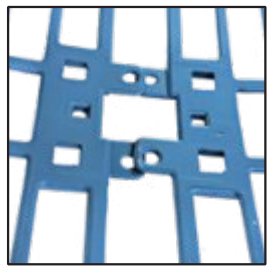
2 X Grid Reflector Petals



Assembly Page 1 of 2



1) Bring together the two reflector petals together with the tabs overlapping. Alternate the tabs over/under.



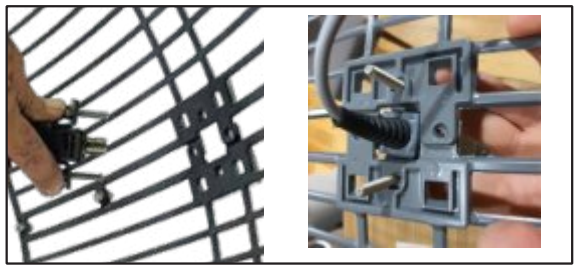
2) Carefully check the tab arrangement. Excess pressure indicates incorrect alignment.



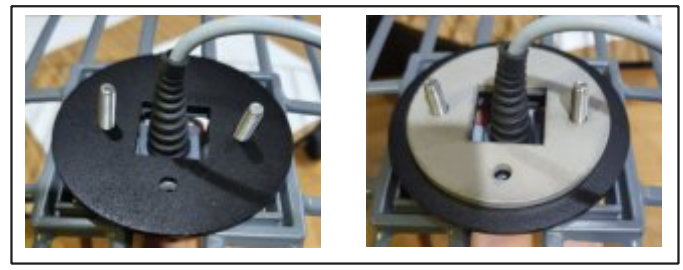
3) With holes aligned, secure the two halves with the short bolts to the four outer positions.



4) All four outer bolts should be secured with the head of the bolt facing inward.



5) With the feeder antenna vertical, use one hand to hold 2 long bolts in place on the left & right arm brackets.



6) Position the feed antenna so bolts & connector pass through reflector.
Place the first Large Articulating Ring over bolts and connectors as shown.
Place the smaller Articulating Ring over the bolts and connectors as shown.





7) L-Bracket
Position U-Bolts, toothed saddle (V-Block) as shown for the best grab on the mast.
Place Washers and Nuts as shown in the photo. Washers allow for smooth slide whilst adjusting elevation angle.

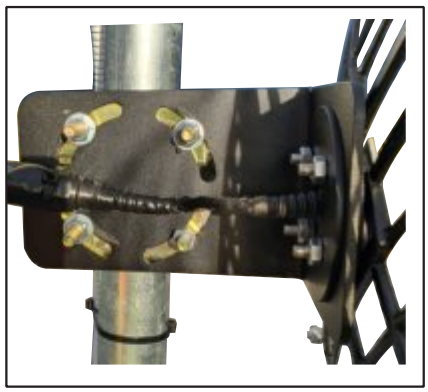
Assembly Page 2 of 2



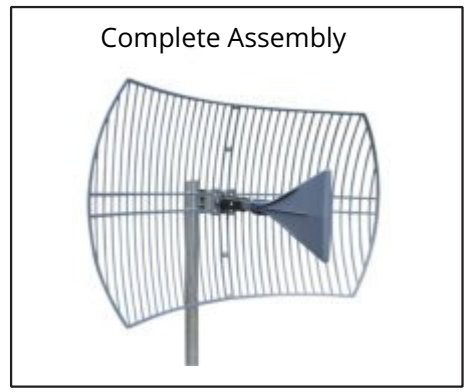
8) Place L-Bracket over the Articulating Ring as Shown. Place second Large Articulating Ring, add washers and nuts as shown. Finalise by adding all the nuts and washers.



9) Completed Bracket fitting to feed and reflector.



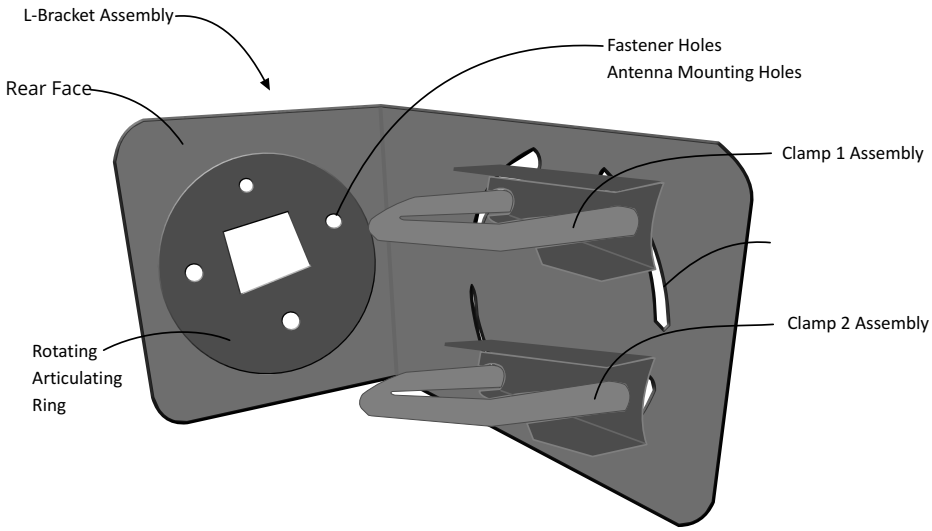
10) Completed Bracket fitted to Antenna Pole



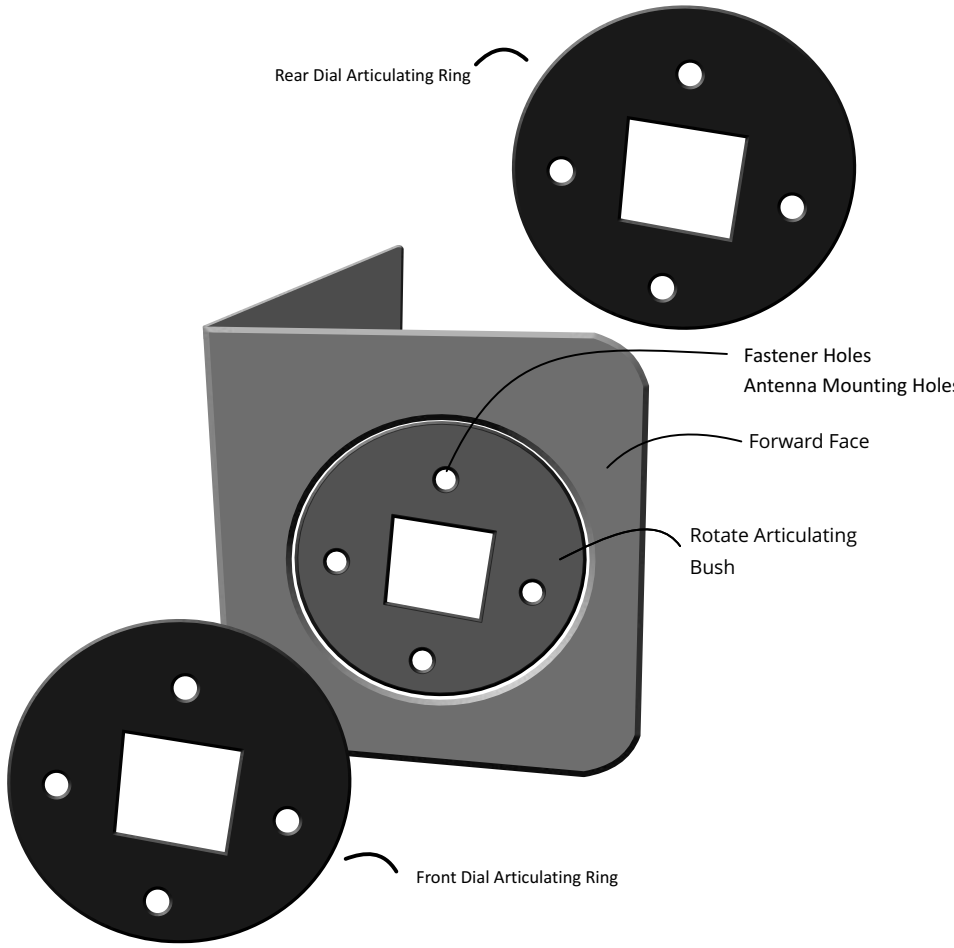
11) Completed Assembly Example

Assembly of the Articulating Bracket

Rear Facing View



Front Facing View



Point, Aim and Optimise Signal

Professional installation by a trained installer of this antenna is recommended!
Note: This is a highly directional antenna. It will work when aimed correctly at the intended target.

1. Guide for Cellular Installation for Cellular Modems and Repeaters and other devices:

- Identify the serving cell towers in your area, by using online tools or available apps.
  If you are unsure, ask your supplier to provide you a desktop engineering analysis with location data and path profiles.
- Point the antenna at the intended cell tower/s.
- If you are using a spectrum analyser, confirm the wanted signal is from that tower.
- Check the signal performance of that signal with test equipment or the end user device.

Notes:
In high density urban areas, there may be a lack of cellular dominance from multiple cell towers received at your location. Spectrum Analysers/Cell advisers are used to pan and point to different cell towers to locate the best serving cell tower to your location whilst presenting the relevant data to optimise signal performance.

Keep in mind the following characteristic of the antenna:

- Low Band - 600-960MHz - beam-width is approx 20 degrees, +/- 10 degrees
- Mid Band - 1700-2700MHz - beam-width approx 12 degrees, +/- 6 degrees
- High Band - 3000-6500 - beam-width approx 12 degrees, +/- 6 degrees

2. Optimising signal quality for experienced installers
Pan, Tilt and Skew (rotated +/- 45 degrees) the antenna to match the cell tower antenna elements and verify the signal performance by checking RSRQ, RSSI, RSSI ~ RSRP Ratio and SINR.

3. Optimising/focusing the feeder antenna
The feeder antenna has four positions to increase performance at a particular band.

- Slide the feeder antenna closer to the reflector to optimise signal performance for lower frequency bands
- Slide the feeder away from the reflector to optimise signal performance for upper frequency bands.
- A 2dB gain and increased directivity is achieved by optimising the feeder antenna for a particular band, thus antenna gain on other bands degrades by 2dB.

4. Tips

- Use high quality low loss coaxial cable such as LMR400 for short cable lengths or where PIM (Passive Intermodulation) is low risk.
- Use ½" Heliax cabling where longer cabling lengths and/or high frequencies are used.
- Ensure line of site
- Use two UWB Grid Antennas where RF MIMO (Multiple In Multiple Out) is required.

5. Video Example

AUS - Analysis against Radiation Protection Standard for Maximum Exposure Levels to Radiofrequency Fields - 3KHz to 300GHz (2002) -- RPS3

Radiation exposure in the table RPS3 Table 7 were based on low powered devices with a transmitter power up to 25dBm connected to the antenna such as a modem, or cellular mobile repeater.

The calculation assumes the closest measurement point at 20cm.

The calculated levels illustrate compliance against the occupational exposure limit at a distance of 20cm.

The calculated levels illustrate compliance against the occupational exposure limit is at a distance of 40cm.

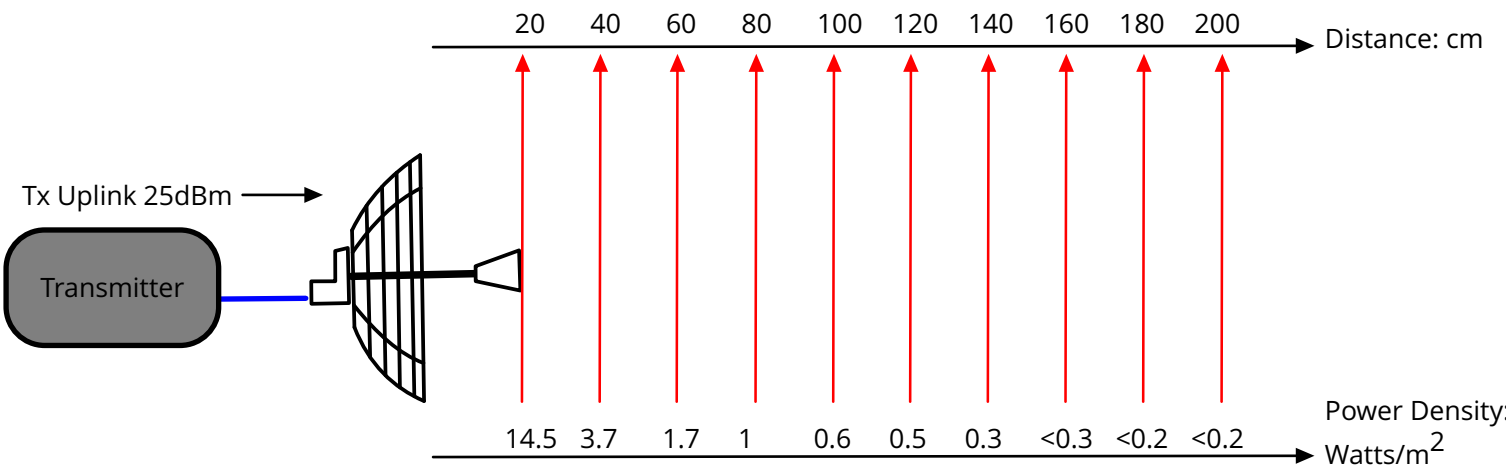
RPS 3 Table 7 Exposure Limit Assessment

	Equivalent plane wave power flux density S_{eq} (W/m²) - Time Average General Public Exposure limit	Equivalent plane wave power flux density S_{eq} (W/m²) - Time Average Occupational Exposure limit	Equivalent plane wave power flux density S_{eq} (W/m²) - Theoretical Result @ 20cm	Equivalent plane wave power flux density S_{eq} (W/m²) - Theoretical Result @ 40cm
700 - 800	3.5	17.5	9.4	2.4
800-900	4.00	20	9.4	2.4
900-1000	4.5	22.5	9.4	2.4
1000-1500	5	N/A	N/A	N/A
1500-1800	7.5	37.5	12.5	3.2
1800-2000	9	45	12.5	3.2
2000-6500	10	50	14.5	3.7

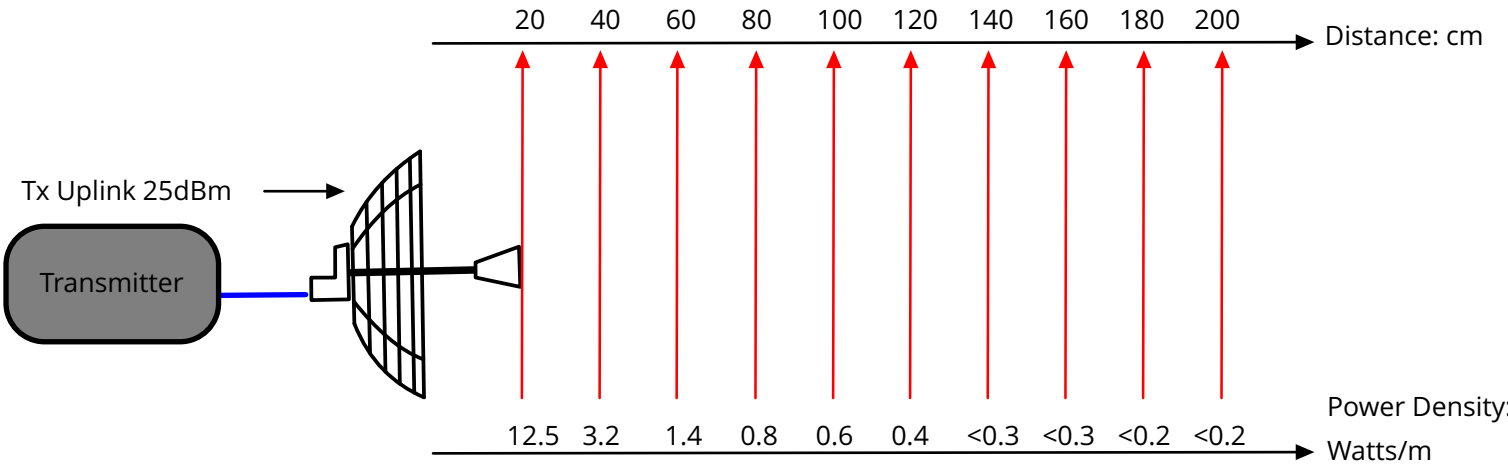
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Power Density Calculation Chart

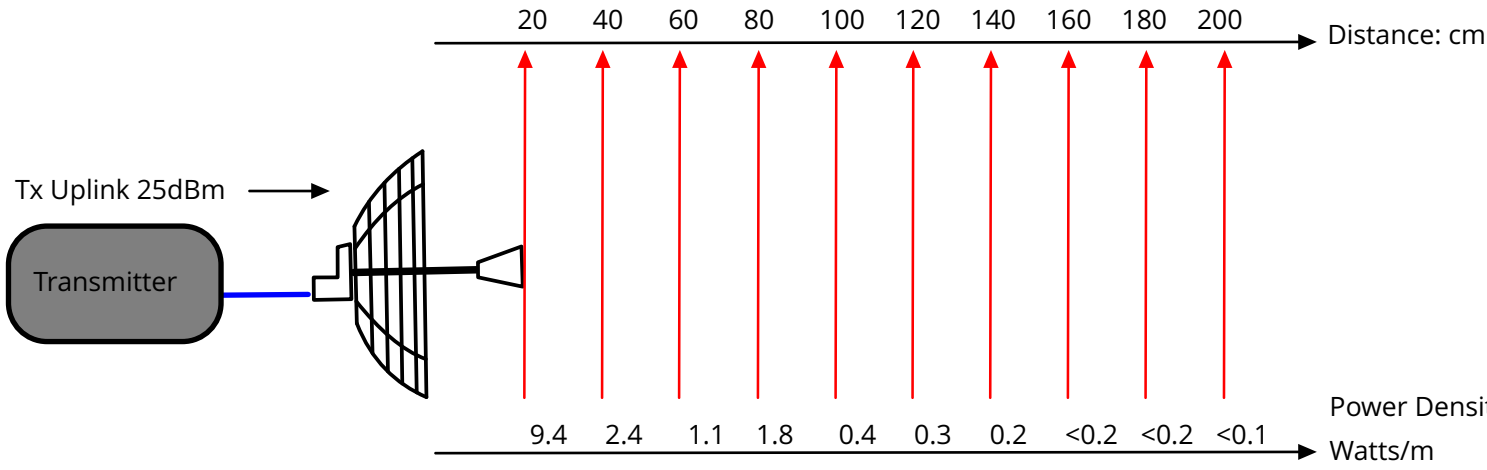
Compliance Analysis Power Density > > 6500MHz Gain = 23



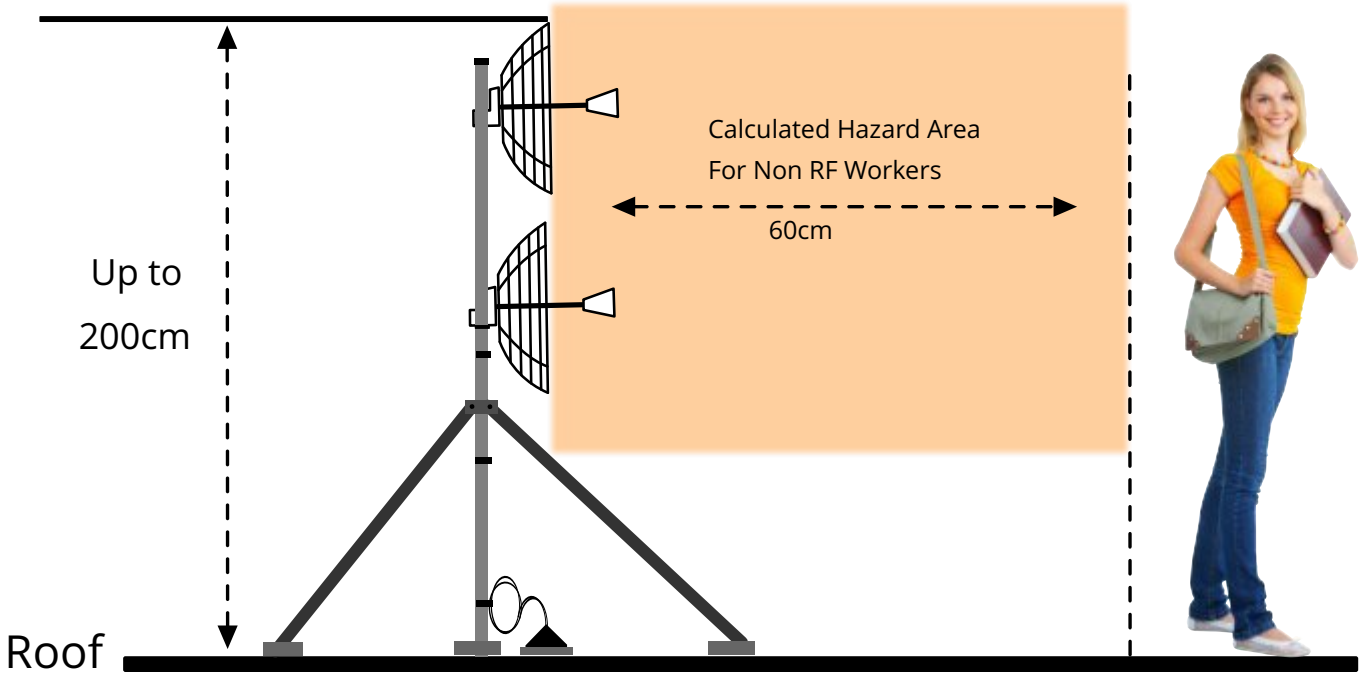
Compliance Analysis Power Density > 1700- 2700MHz Gain = 20



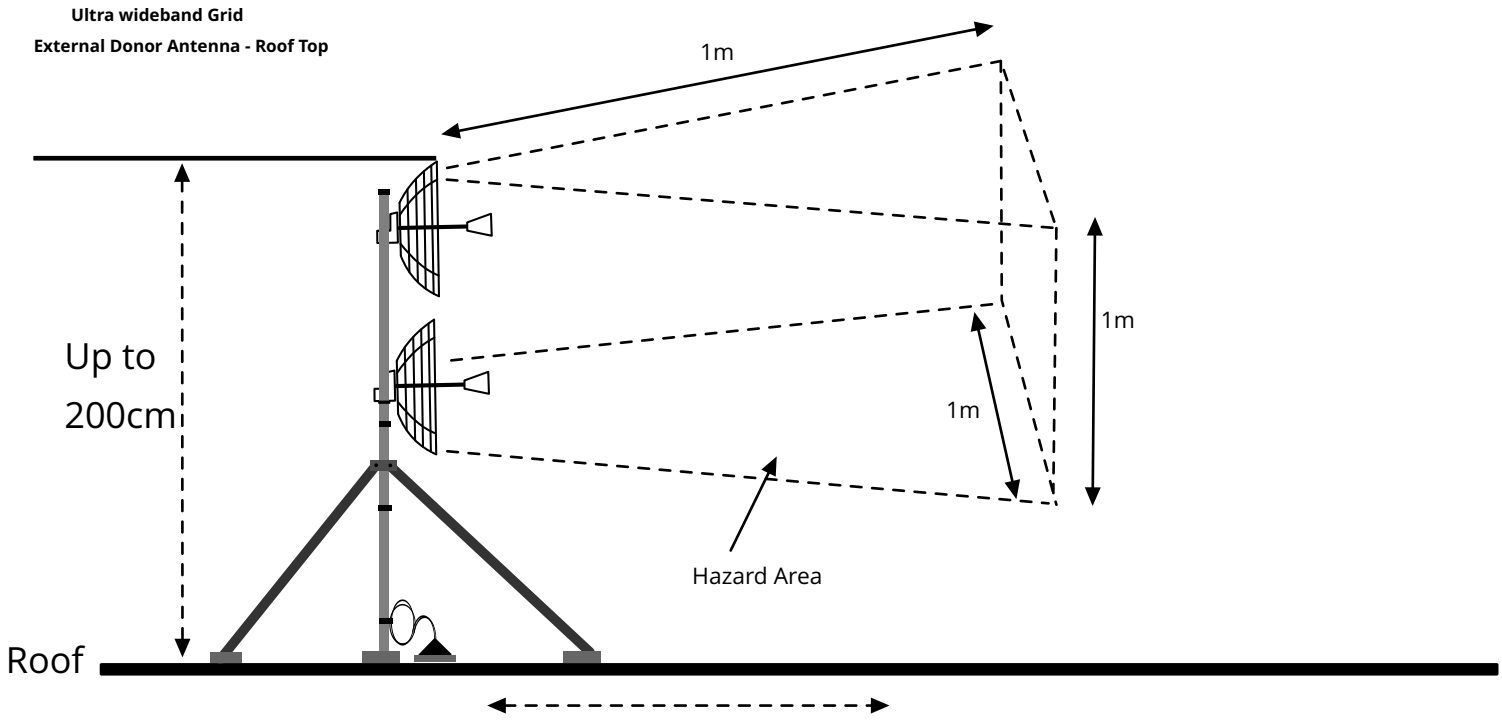
Compliance Analysis Power Density > 700- 960MHz Gain = 15



Radiation Hazard Clearance Areas

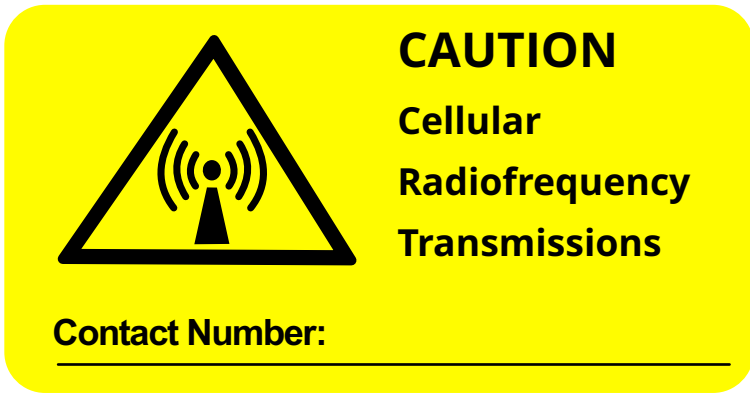


Recommended Clearance Diagram



©Proeye Communications and Security Systems

RF Warning Label Recommendation



Recommend Placement on Antenna and Antenna Pole.

Note: The installer should check with local and Commonwealth Legislation about relevant rules and regulations and requirements which may include providing a Radiation Hazard Site Folder to the client.

Note:

This EME Radiation information was based low powered deceives where the cumulative power to the antenna does not exceed 25dBm.

This information may be required to be used as part of a Radiation Hazard Compliance Folder and maintained by the relevant persons. It can be used to assist in Occupational Health and Safety requirements, to assist persons required work on the antenna or work near the antenna.

Note:
For higher power signals, exceeding 25dBm presented to the antenna, the responsible person is required to calculate the EME exposure limits and determine the safety exclusion zone.

Proeye Communications and Security Systems can assist in providing calculations and modelling as required.

End of Document