



# CONNEX PROSIGHT ANTENNA GUIDELINES

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**Whether you plan to use CONNEX ProSight antennas, or design your own, we highly recommend following these guidelines:**

## Full 5GHZ Frequency Band Support

The ProSight antennas are designed to cover the full span of the 5GHz unlicensed band, between 5150MHz and 5925MHz. This capability to function well, without degradation at any of the sub-bands, allows the ProSight system to:

- Archive best performance over all available bands
- Select the best available channel over the entire band (ProSight enables 'Automatic Frequency Selection')
- Coexist better with all other ProSight systems
- Coexist better with other analog systems
- \* Note: Analog systems usually utilize the sub-band of 5600MHZ to 5900MHZ, hence their antennas are designed to function best at these frequencies

\* Note: This is also the case with most circular antennas

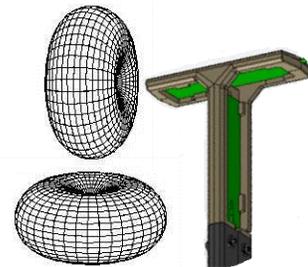
## Two Transmitting Antennas, Five Receiving ones

CONNEX ProSight uses MIMO (Multiple Input and Multiple Output) and diversity technology. This means the ProSight HD Transmitter uses two transmitting antennas, while the ProSight HD Receiver uses five receiving antennas.

This ProSight MIMO configuration was specially architecture to support the unique requirements of the PFV Racing drones: Fast maneuvers and high speeds.

The "T" shaped antenna was selected after rigorous tests, with multiple antenna types at various configurations:

- The link will remain stable as long as at least one of the transmitting antennas' beam is pointing towards the receiving antennas
- The RF beam of the ProSight transmitting antennas is omnidirectional:
  - The horizontal antenna's RF signal propagates like a "bagel" that is 90 degrees to the ground (the "bagel" center hole/null is where the Tx power = zero):
  - The vertical antenna's RF signal would propagate like a "bagel", in parallel to the ground:



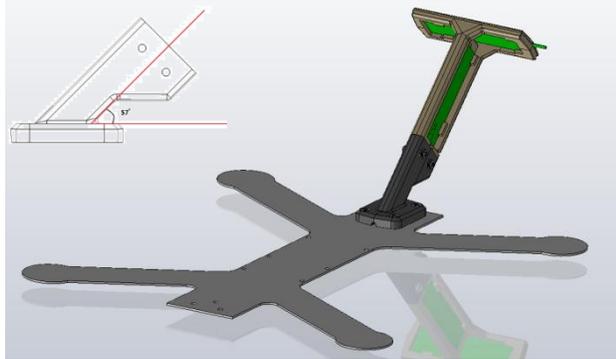
The RF beam of the ProSight receiving antennas is vertical omnidirectional as well. Therefore the best configuration for a robust link for a maneuvering drone would be to have the two transmitting antennas placed at 90 degrees to each other and setting all five receiving antennas straight upwards. This configuration best ensures that at least one antenna will be in a vertical/almost vertical position towards the Rx antennas at any position of the drone.



## Line Of Sight

RF signals are obstructed, absorbed and reflected by physical obstacles on their path. Therefore one should consider best performance at a clear line of sight setup. Unfortunately, the drone's body itself can become an obstacle to the RF signal, if placed between the transmitting and receiving antennas. For this reason we strongly recommend:

- Placing the transmitting antennas at least **3 cm (1.2 inch)** away (usually above) from the body further reduces the possible signal obstruction.
- Place the transmitting antennas at the **rear** of the drone. Quads tend to tilt forward, so most of the flight time the antennas will be at the highest point, and therefore less obstructed by the body
- CONNEX ProSight antennas are placed at **33 degrees back** from the vertical position. This allows the antennas to be vertical during most of the flight time (which introduce best antenna pattern), as the drone tilts forward, and is a good compromise between fast flight and hovering. The horizontal antenna's positioning was selected so it covers the transmission during role of the drone
- Avoid any metal or cables near the antennas:
  - Try to place the antenna's **RF cable as far as possible** from the antenna's body – otherwise it becomes an obstacle by itself
  - Be aware that other materials (including plastic) which are covering/connected to the antennas, DO affect the antenna performance.



## Platform Considerations

- The CONNEX ProSight link is bi-directional, full-duplex, meaning the HD transmitter antennas also receive data from the ProSight HD Receiver. For that reason we recommend not to place any other transmitting antennas in close proximity to the ProSight HD Transmitter antennas
- The antennas' RF cables are rigidly connected to the ProSight HD Transmitter connectors. We suggest to secure the RF cables in a way that they will not be pulled out from the connectors of the ProSight HD Transmitter during crashes.