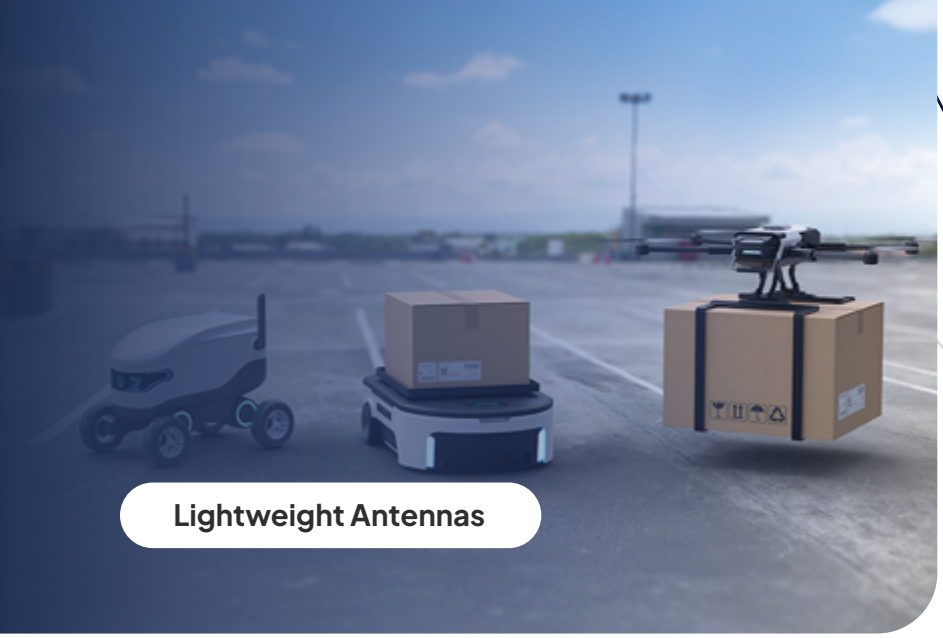

Lightweight Antennas

CALIAN®
Confidence. Engineered.

For UAV applications, the combined weight of system components is a crucial consideration. Calian offers a wide range of GNSS antennas specifically designed to provide both very high-performance and extremely low weight. Calian's range of housed and embedded antennas supports single, dual, triple-band GNSS and L-Band Corrections. Iridium active, passive and switchable, active GNSS and passive Iridium models are also available.

Dual Band OEM
Accutenna® Patch Antenna

TW8000 Series
Accutenna® Patch Antenna

Housed and Embedded
Helical Antennas

VeroStar® Mini
Embedded Antenna

Calian patch element antennas feature our patented dual-feed Accutenna® technology, which provides a substantially purer right hand circularly polarized response over the full antenna bandwidth. Accutenna® products provide enhanced rejection of cross-polarized signals, which commonly results from signal reflections (multipath), which otherwise would have the effect of "blurring" the received signals.

The patented Helical line of antennas is ideal for UAV applications as they are very light and do not require a ground plane.

Calian's patent-pending mini VeroStar™ is designed for larger UAVs. The VeroStar™ antenna element has a low profile and provides exceptionally strong gain at low elevation angles making it ideal for dynamic applications.

Calian antenna products feature low loss prefilters that guard against near-band interfering signals. The eXtended Filtering (XF) line takes filtering to a new level and strongly mitigates new and anticipated (Ligado) LTE signals.

When precision matters, choose Calian antennas for all your Precise Point Positioning (PPP) & Real-Time Kinematics (RTK) positioning applications.

Lightweight Antenna Families

Accutenna® Ceramic Patch Antennas

Ceramic patch antennas are ideal for many Unmanned Aerial Vehicles (UAVs). Housed models can be attached to the surface of the UAV and the embedded models can be installed in the body of the UAV. Calian's small capacitively feed dual-pin patented Accutenna technology enables the patch to be very small and lightweight (18 - 75 g) and at the same time support a wide bandwidth, which is important for today's high-precision applications. Dual-feed enables the antenna to provide a better axial ratio (measure of the circularity of the received signal), which results in multipath mitigation and a cleaner right-hand circular polarized signal.

Calian's Accutenna family of antennas provides multi-constellation, multi-signal and L-band correction support.

A selection of Accutenna® models are listed in Table 1.1

Helical Antennas

Calian offers a wide range of high-performance helical antennas that are ideal for lightweight UAVs. The helical antennas are available in housed (IP67–rated) or embedded models. The housed models weigh between 25 - 45 g and the embedded models weigh between 4 - 12 g. The helical antenna family features a precision-tuned helix element that provides excellent axial ratio, which strongly mitigates multipath and operates without the requirement of a ground plane, making it ideal for a wide variety of UAV applications. Calian's helical family of antennas provides multiconstellation, multi-signal, and L-band correction support.

A selection of helical models are listed in Table 1.2

VeroStar™ Mini Embedded Antennas

The patent-pending VSM6×28 family of embedded (58 - 69 g) antennas employ Calian's unique VeroStar™ technology which provide many unique features. The VeroStar antenna's design allows it to provide high gain over the full GNSS spectrum, exceptionally low roll-off from the zenith to the horizon, and an optimized axial ratio at all elevation angles, resulting in excellent multipath rejection. These features enable accurate and precise code and phase tracking of GNSS and L-band correction signals. Calian's VeroStar family of antennas provide multi-constellation, multi-signal, and L-band correction support.

A selection of VeroStar™ mini embedded models are listed in Table 1.3

Table 1.1: Accutenna® Models

Type	Model	⊹	Weight (g)	Bands																
				L1	L2	L5	G1	G2	G3	E1	E5a	E5b	E6	B1	B2	B2a	B3	L5	L6	Iridium
OEM Patch	TW1721/TW1722		20	●			●			●				●						
	TW1825		35	●		●	●			●	●			●		●		●		
	TW1829		35	●	●		●	●		●				●						
	TW1889		35	●	●		●	●	●	●		●		●	●					
	TW3867		75	●	●		●	●		●				●						
	TW3872E		75	●	●		●	●		●				●						
	TW3967	⊹	75	●	●	●	●	●	●	●	●	●		●	●	●		●		
Housed Patch	TW4721/TW4722		35	●			●			●				●						
	TW2600		110																	●
	TW8825		55	●		●	●			●	●			●		●		●		
	TW8829		55	●	●		●	●		●				●						
	TW8889		55	●	●		●	●	●	●		●		●	●					
	SSL885XF		45	●	●		●	●		●				●						

Table 1.2: Helical Models

Type	Model	⊹	Weight (g)	Bands																
				L1	L2	L5	G1	G2	G3	E1	E5a	E5b	E6	B1	B2	B2a	B3	L5	L6	Iridium
OEM Helical	HC600E		10																	P
	HC610E		10																	A
	HC843E		12	●	●		●	●		●				●						P
	HC860E		12	●	●		●	●		●				●						A
	HC871/XF		10	●	●		●	●		●				●						
	HC872/XF	⊹	12	●	●		●	●		●				●						
	HC882/XF	⊹	12	●	●		●	●	●	●		●		●	●					
	HC976E	⊹	12	●	●		●	●		●			●	●			●		●	
	HC977/XF	⊹	12	●	●	●	●	●	●	●	●	●		●	●	●		●		
	HC990EXF	⊹	11	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
Housed Helical	HC600		24																	P
	HC610		24																	A
	HC843		42	●	●		●	●		●				●						P
	HC860		42	●	●		●	●		●				●						A
	HC871/XF		25	●	●		●	●		●				●						
	HC871SXF		23	●	●		●	●		●				●						
	HC872/XF	⊹	42	●	●		●	●		●				●						
	HC882/XF	⊹	42	●	●		●	●	●	●		●		●	●					
	HC976	⊹	42	●	●		●	●		●			●	●			●		●	
	HC977/XF	⊹	42	●	●	●	●	●	●	●	●	●		●	●	●		●		
	HC990XF	⊹	45	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
	HC997SXF	⊹	33	●	●	●	●	●	●	●	●	●		●	●	●		●		

Table 1.3: VeroStar™ Mini Embedded Models

Type	Model	⊹	Weight (g)	Bands																
				L1	L2	L5	G1	G2	G3	E1	E5a	E5b	E6	B1	B2	B2a	B3	L5	L6	Iridium
Crossed Dipole	VSM6028-090		58	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
	VSM6028L-090	⊹	58	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
	VSM6028L-106	⊹	69	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
	VSM6328L-090	⊹	58	●	●	●	●	●	●	●	●	●		●	●	●		●		
	VSM6328L-106	⊹	69	●	●	●	●	●	●	●	●	●		●	●	●		●		

⊹ L-Band Correction Services, A = Active, P = Passive

● GPS/QZSS ● GLONASS ● GALILEO ● BEIDOU ● IRNSS/NAVIC ● QZSS ● IRIDIUM

CALIAN®
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Installation & Filtering

Custom Tuning Services and Installation Guides

Custom embedded installations can detune (shift the frequency) the antenna. To optimize antenna performance and assist customers, Calian provides an Embedded Antenna Installation Guide that identifies best practices and highlights potential pitfalls. Even if best practices are followed, detuning can still occur in a custom antenna installation. To ensure that the embedded antenna installation provides optimum performance, Calian offers customers a custom tuning service. If this optional service is selected, then all subsequently purchased antennas will be custom-tuned to the specific enclosure.

eXtended Filtering (XF)

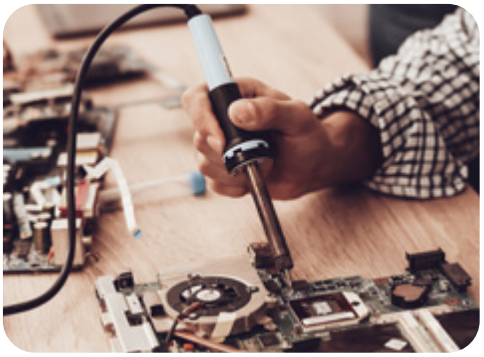
The radio frequency spectrum has become more congested as new LTE bands are activated and their signals or harmonic frequencies [e.g. 800MHz x 2 = 1600 MHz (GLONASS - G1)] can affect GNSS antennas and receivers.

In North America, planned Ligado signals at 1526–1536 MHz can especially impact GNSS antennas that support space-based L-band correction services (1539 - 1559 MHz). New LTE signals in Europe [Band 32 (1452 - 1496 MHz)] and Japan [Bands 11 and 21 (1476 - 1511 MHz)] have also been observed to interfere with GNSS signals. In addition, Inmarsat satellite communication (uplink: 1626.5 - 1660.5 MHz) can also affect GNSS signals. The new Calian XF antennas have been designed to mitigate out-of-band signals and prevent GNSS antenna saturation. Calian's custom XF filtering mitigates all existing signals and new Ligado and LTE signals, enabling the antennas and attached GNSS receivers to perform optimally.

Customization with Calian

Calian excels at supporting the requirements of any customer project – and this includes collaborating with teams to modify our products to adapt to their needs. Calian has deep expertise in this field and an extensive track record working with some of the largest brands in the world to support their custom application.

Learn more: calian.com/gnss/customization



About Calian

We keep the world moving forward. Calian® helps people communicate, innovate, learn and lead safe and healthy lives. Every day, our employees live our values of customer commitment, integrity, innovation and teamwork to engineer reliable solutions that solve complex problems. That's Confidence. Engineered. A stable and growing 40–year company, we are headquartered in Ottawa with offices and projects spanning North American, European and international markets. Visit **calian.com** to learn about innovative healthcare, communications, learning and cybersecurity solutions.

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