

4.1 meter Ka-band

Broadband gateway Earth station antenna

Designed for the latest high-capacity Ka-band satellites, Viasat's 4.1-meter antenna system offers exceptional broadband support to deliver high-speed connections for residential, commercial, and government services.

Our 4.1-meter Ka-band antenna system is ideally suited for worldwide high-performance geostationary Ka-band gateway applications. With decades of experience going into the design, our 4.1meter Ka-band antenna's performance, reliability, and maintainability are exceptional.

The Cassegrain-shaped antenna with precision reflector surfaces provides superior gain and side lobe performance at Ka-band and higher frequencies. The carbon fiber antenna panels, back structure, spars, and sub-reflector provide a rigid structure that maintain its shape in extreme thermal environments, including during de-icing operation. The antenna is easily assembled including a bolt-together reflector that achieves accurate surface and sub-reflector alignment without special equipment or skills.

The convenient rear-mounting frame design supports multiple redundant suites of high-power amplifiers (HPAs), low-noise amplifiers (LNAs), and converter configurations with minimal waveguide loss.

The rugged mount maintains Ka-band pointing accuracy in adverse wind conditions. Azimuth utilizes low-backlash dual drives with active torque bias. Elevation uses a novel fine and coarse drive configuration (patent pending) that greatly reduces jackscrew wear when tracking geostationary satellites. Routine service can be performed without taking the antenna out of service. Optical encoders in both axes provide precision position feedback.

Our 5th generation antenna control system offers DC servo performance with adaptive step tracking for unparalleled tracking performance. For quick access and service, the control system can be conveniently located at the pedestal or is available in an indoor rack mount configuration.



4.1-meter at-a-glance

- › Antenna designed to meet Federal Communication Commission (FCC), International Telecommunication Union (ITU), ANATEL, and Eutelsat regulations
- › High-efficiency-shaped Cassegrain optics
- › Bolt-together carbon fiber reflector requires no field alignment
- › 2-port and 4-port circularly and linearly-polarized feeds available
- › Precision structural steel mount
- › Easily accessible rear-mounting frame for electronics packages
- › Standard accessories include foundation template and anchor bolts, lightning protection kit, and rain blower
- › CE compliant
- › Damage-resistant feed window

OPTIONS

- › Electric de-icing
- › HPA/LNA/converter mounting
- › Environmentally-controlled rack equipment cabinet
- › Alternate frequency bands including Q- and V-bands

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ELECTRICAL		MECHANICAL	
Operating frequency¹ (GHz)		Optics	Dual-shaped Cassegrain, axis-symmetric
› Receive	17.7 to 21.2	Reflector	
› Transmit	27.5 to 31.0	› Diameter	4.1 m
Gain (at feed port)		› Panels	8 self-aligning
› Receive	56.0+20Log(F/18.95) dBi	Mount type	Elevation over azimuth
› Transmit	59.4+15Log(F/28.75) dBi	Axis drives	
G/T (20° EL, clear sky)²		› Elevation	Slewing drive, 0.1 °/sec
		› Azimuth	Slewing drive, 0.1 °/sec
Antenna noise temperature (at listed elevation)		Axis travel	
› 10°	83 K	› Elevation (course)	0° to 90°, continuous
› 20°	54 K	› Elevation (fine)	±0.25°, about coarse position
› 60°	32 K	› Azimuth	±95°, continuous
› 90°	31 K	Servo	› Brushless DC servo motors (AZ and EL fine)
Beamwidth (3 dB)			› AC slewing motor (EL coarse)
› Receive	0.23° Nominal		› Optical encoders
› Transmit	0.16° Nominal		› Digital servo control
Feed system³			› SGP4 orbit determined program track
	› 4-port TX/RX circular polarization		› Step track over program track augmentation
	› WR34 TX ports/WR42 RX ports		
	› 600 W CW transmit power per port, simultaneous		
	› 85 dB TX/RX and RX/TX isolation		
VSWR TX and RX		ENVIRONMENTAL	
	1.25:1	Temperature	
Polarization⁴		› Operational	-40° to +55° C
› Sense	Simultaneous RHC and LHC	› Storage	-45° to +70° C
› Axial ratio	1.06:1 (0.50 dB)	Wind	
Pattern envelope		› Operational (any position)	45 mph (72 km/h) gusting to 60 mph (97 km/h)
Compliant to ITU 580, FCC 25.209		› Survival	125 mph (200 km/h), stowed
Tracking accuracy		Atmospheric conditions	
Steptrack over program track 0.042° RMS BRE, winds 30 mph gusting to 45 mph		Salt, pollutants, and corrosive contaminants as conditions found in coastal and industrial areas	
De-ice gain degradation		De-icing (optional)	
0.25 dB (maximum)		Resistive heaters with automatic control	

¹ Other frequency bands within 17.7 to 21.2 GHz and 27.0 to 31.0 GHz bands available, Q/V-band feeds also available.

² Including non-redundant 110K LNA and feed to LNA waveguide.

³ Other feed configurations available.

⁴ Linear and linear/circular switchable polarization options available.

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