

CESIUM ASTRO

SPACE & DEFENSE SYSTEMS

Values listed in specifications tables are mission-dependent and subject to change.

© 2024 CesiumAstro Inc. All rights reserved.

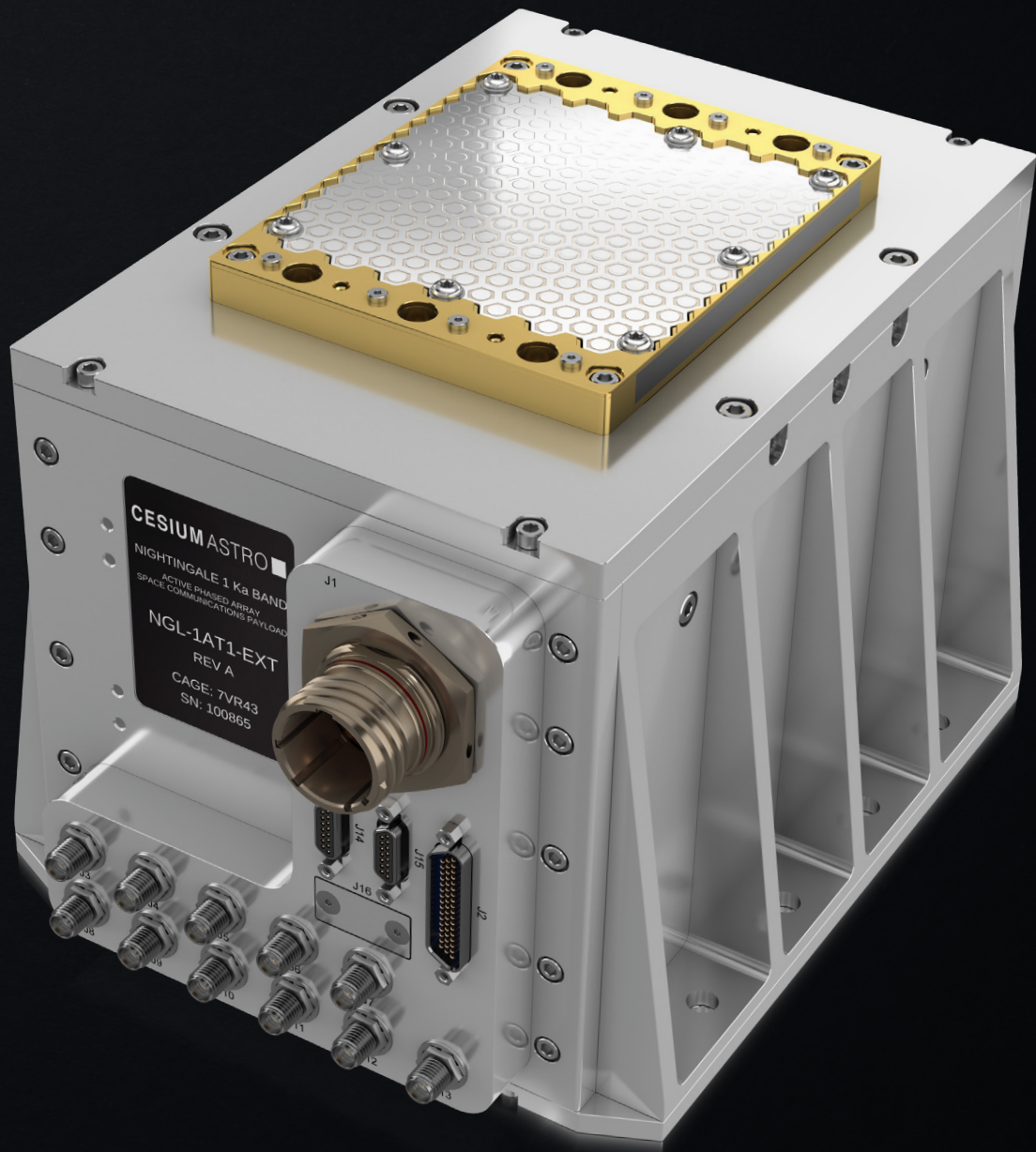
Nightingale

Steerable Single-Beam Communications System

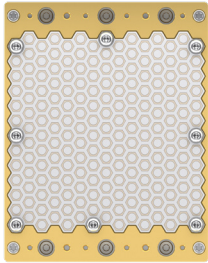
Two-Way High-Speed Connectivity

The **Nightingale** active phased array satellite payload is a complete hardware communications solution requiring only data and power connections. Downlink at speeds exceeding 500 Mb/s using standard waveforms, such as DVB-S2(X), with an electronically steerable beam that provides horizon-to-horizon coverage from LEO without body pointing.

Nightingale is software defined, supporting user-customizable waveforms and Linux-based applications that can be tested in-lab and then deployed on-orbit.



System Architecture



APA-1AT1
Single-Beam Ka-Band
Active Phased Array Antenna



PCU-2812
Power Conditioning Unit



SDR-1001
Software-Defined Radio



SBC-1461
Single-Board Computer



UDC-1AT1
Up/Down Converter

Flight-Ready at Scale

Fully integrated payload certified to NASA GEVS standards, leveraging volume manufacturing techniques, and available at commercial scale.

Scalable Antenna Solution

Multiple active phased array tiles can combine for improved RF performance, increasing EIRP by roughly 6 dBW and G/T by 3 dB/K each time the antenna aperture doubles in surface area.

Software-Defined Reconfigurability

Utilize standardized DVB-S2, DVB-S2X, and CCSDS waveforms, or design and integrate your own, with the integrated, fully reprogrammable software-defined radio and single-board computer.

Full-Stack Communications

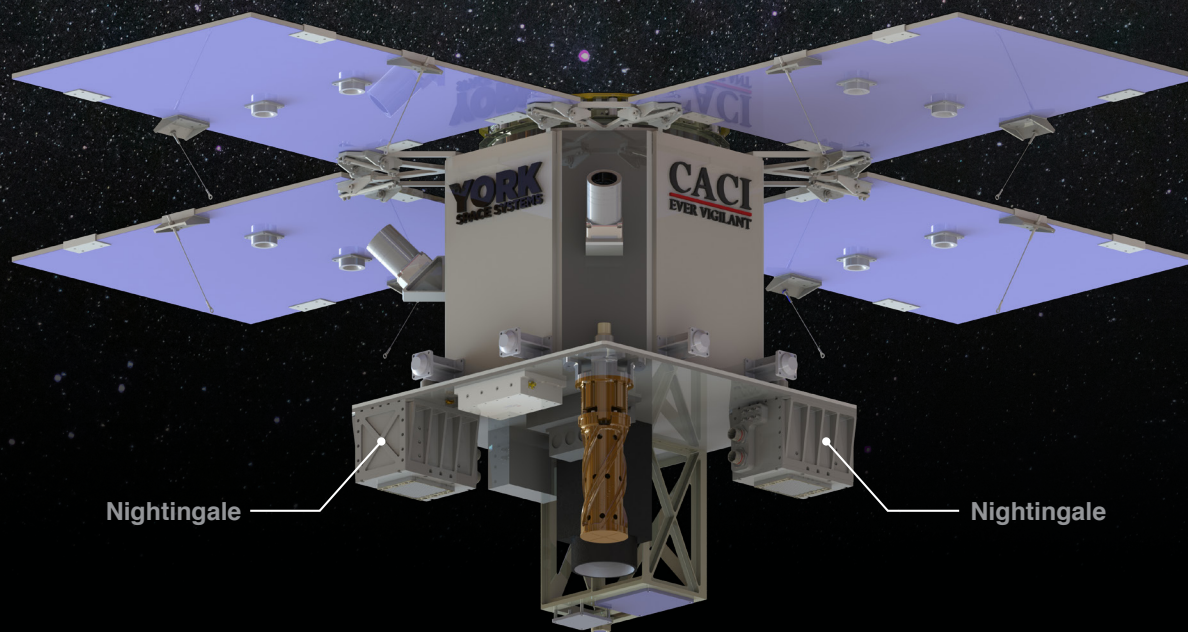
Turnkey configurations implement a full communications stack providing an Ethernet-to-RF solution with fully documented APIs for commanding the digitally steerable antenna array.

Rugged and Compact

The compact design is well-suited for challenging space and airborne environments

Supporting Mission Success

Every payload comes with a full suite of documentation, including CAD models, a mechanical ICD, an electrical ICD, and a programming guide, plus access to **CesiumAstro** engineers.



CACI International selected the **Nightingale** payload to provide software-reconfigurable capabilities for its DemoSat, a LEO demonstration mission utilizing their custom waveforms and IP. Our Nightingale payloads are enabling positioning, navigation, and timing (PNT) and tactical intelligence, surveillance, and reconnaissance (TactISR).

Specifications

Frequency	24.5 GHz to 29.5 GHz
Beamwidth	8° minimum, with one tile
Instantaneous Bandwidth (Per Channel)	Tx: 200 MHz Rx: 100 MHz
EIRP at P1dB	30 dBW
DC Input Voltage	22 V to 36 V
Baseplate Operating Temperature	-24°C to 51°C
Mass	4.8 kg typical



CESIUM ASTRO

WORLDWIDE



Austin, TX

Headquarters + Manufacturing



El Segundo, CA

Systems Engineering



United Kingdom

Wireless Communications

cesiumastro.com

sales@cesiumastro.com

media@cesiumastro.com