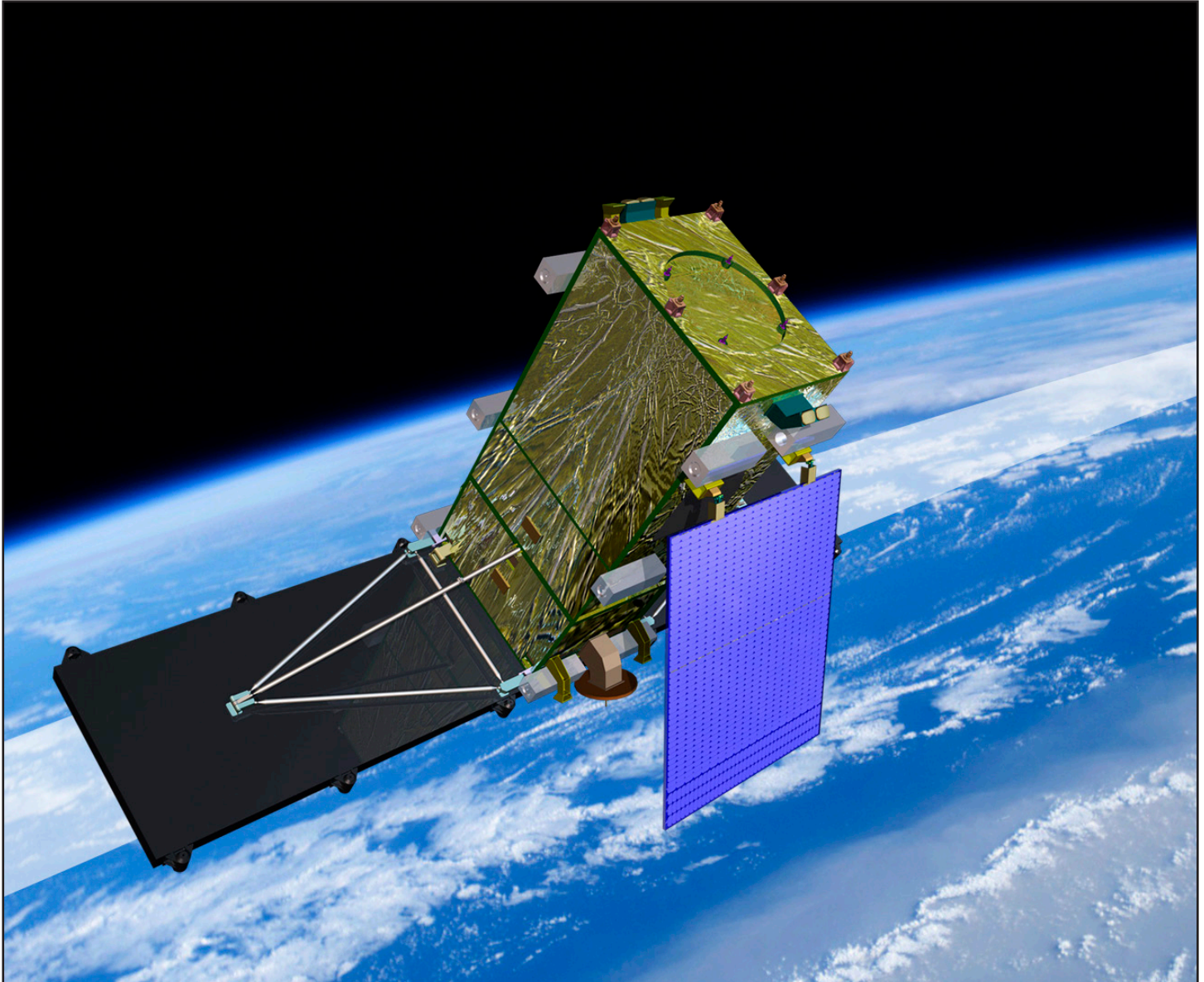
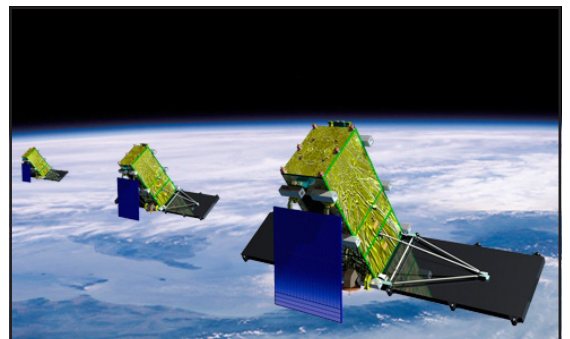
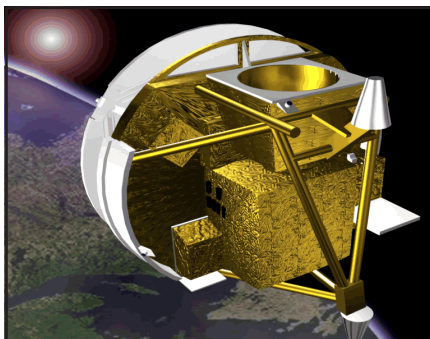


# MAGELLAN SATELLITE BUSES



SCALABLE ARCHITECTURE • HIGH RELIABILITY • FLIGHT-PROVEN DESIGNS



## OVERVIEW

Magellan offers a family of spacecraft bus solutions consisting of the microsatellite-class MAC-100 and MAC-150, and the smallsat-class MAC-200. The MAC-100 bus was used on the Canadian Space Agency's SCISAT-1 mission, and the MAC-200 bus was used for the CASSIOPE mission and RADARSAT Constellation Mission (RCM). The newly developed MAC-150 bus is baselined for use on an upcoming mission in 2025. Magellan is providing its NextGeneration microsatellite (MAC-150) for Canada's Department of National Defence and bus avionics for commercial clients in North America for missions in LEO and deep space. Magellan (MAL: TSX) has facilities in North America, Europe, and India. Magellan has NATO Secret facility clearance, is registered under the Joint Certification Program (JCP) of the U.S. Defence Logistics Agency, and is eligible for the Canadian exemption under ITAR Part 126.5.

	MAC-100 Microsatellite Bus	MAC-150 Satellite Bus	MAC-200 Satellite Bus
<b>Spacecraft Specifications</b>			
Bus Dry Mass (without payload)	100 kg	100 to 150 kg (scalable)	Up to 1,000 kg (mission dependent)
Bus Power (without payload)	32 W (orbit average)	< 100 W (typical)	Up to 200 W (orbit average, typical)
Solar Array Power	110 W (BOL orbit average)	120 to 300 W (scalable)	>1,000 W (scalable)
Solar Array Configuration	Body-fixed	Body-fixed or Deployed	Body-fixed or deployed
Redundancy	Single-string	Single-string	Dual-string
Bus Reliability	0.84 at 2 years	New Space	0.89 at 7 years
Design Lifetime	2 years	5+ years	7+ years
Flight Heritage	SCISAT-1 (on-orbit since 2003)	Scheduled for 2026 launch	CASSIOPE (on-orbit since 2013) RADARSAT Constellation Mission (on-orbit since 2019)
<b>Payload Accommodations</b>			
Mass	50 kg	50 kg	Up to 530 kg (mission dependent)
Volume	0.12 m <sup>3</sup>	0.2 m <sup>3</sup>	Mission dependent
Power	65 W average, 100 W peak	20 to 200 W (orbit average)	500 W average, 2 kW peak (scalable)
Voltage	28±6 V <sub>DC</sub> (unregulated)	28±6 V <sub>DC</sub> (unregulated)	28±6 V <sub>DC</sub> (unregulated)
Data Interface	RS-422 @ 4 Mbps	RS-422, CAN, Ethernet, Spacewire	RS-422 @ 4 Mbps, CAN @ 1 Mbps
Data Storage	1.5 GB	128 GB	2.0 GB (expandable)
<b>Guidance, Navigation and Control (GNC)</b>			
ADCS Architecture	3-axis, bias momentum	3-axis, zero momentum	3-axis, zero momentum
Attitude Knowledge (3σ)	<0.02° (pitch/yaw), <3° (roll) with Sun sensor and magnetometer	< 0.005° (bias, all axes)	<0.007° (bias, all axes)
Attitude Control (3σ)	<0.2° (pitch/yaw), <3° (roll) with Sun sensor and magnetometer	< 0.01° (bias, all axes)	<0.011° (bias, all axes)
Pointing Performance	<240 arcsec	< 20 arcsec	<20 arcsec
Propulsion	None	Electric	Hydrazine monopropellant
<b>Command and Data Handling (C&amp;DH)</b>			
TT&C Protocol	CCSDS and STDN compatible	CCSDS compatible	CCSDS and STDN compatible
Command Uplink	S-band, 4 kbps (CCSDS compliant)	S-band, 256 kbps (CCSDS compliant)	S-band, 4 kbps (CCSDS compliant)
Telemetry Downlink	S-band, 4 Mbps (CCSDS compliant) Reed-Solomon encoding (optional)	S-band, 2 Mbps (CCSDS compliant) X-band option, 1 Gbps (CCSDS)	S-band, 4 Mbps (CCSDS compliant) Reed-Solomon and Convolutional encoding (optional)

## ABOUT MAGELLAN AEROSPACE

Magellan Aerospace is a global aerospace company that provides complex assemblies and systems solutions to space customers, aircraft and engine manufacturers, and defence agencies worldwide. Magellan's Space and Rockets business has more than 60 years of flight heritage on CSA and NASA missions, including launches of its Black Brant sounding rocket, sub-orbital payloads, experiments aboard human spaceflight missions, and Earth-orbiting satellite missions.

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