TAKE ME 2 SPACE

Darwin (30-50Kg MicroSat Bus)

Technical Specifications

1. Project Overview

TM2Space will provide a custom satellite bus platform designed according to the customer's payload and mission requirements, with all the required subsystems included. Depending on the deployer used, the overall mass category of the satellite can be adjusted up to 50 kg, and the weight, dimensions & subsystems of the bus can be customised accordingly. A basic configuration of a 30 kg micro satellite bus is provided below.

1.1 Systems of the Satellite Bus

Subsystem	Quantity	Datasheet
AeroMag Control	1	https://drive.google.com/file/d/1Rh9TsQo_UHn3Y_sZMEnN0YogzLg2WYOm/view?usp=drive_link
IMUCube	1	https://drive.google.com/file/d/1wxFjfrBo75SXVAAFbgQ8tfXBwoXeHjK3/view?usp=drive_link
Deployed Solar Panels	0 (body mounted only) 2 (single deployed) 4 (double deployed)	https://drive.google.com/file/d/1ALYJK1dbdKuqfM6c9z3dKbrm-YU8LwAz/view?usp=drive_link
EPS	1	https://drive.google.com/file/d/1zCM6gKKXOwGaiZE67J3RjWI1SOWTupNv/view?usp=drive_link
Battery Pack	4	https://drive.google.com/file/d/15H1onnKZB98vK

(50Wh)		wd1Rz8Mi7vHzW7chY4C/view?usp=drive_link
CMCube (OBC)	1	https://drive.google.com/file/d/106FxmrFTz8CbKcdiPlhrEHqjJz22DSsd/view?usp=drive_link
SunSense (Coarse)	6	https://drive.google.com/file/d/1sdqSaDwkxuQylodNWsEMFu1Nxbg7n5S7/view?usp=drive_link
NavCube (GPS)	1 (Board + Antenna)	https://drive.google.com/file/d/1LojaELN4eITXp4JDpIHQJtL6G7wfGFIW/view?usp=drive_link
Reaction wheel (30mNms)	4	https://drive.google.com/file/d/1wh4sM-hyp9qrT49_q3j2wB-rOO7SSlfe/view?usp=drive_link
StarSense Lite	1	https://drive.google.com/file/d/1LEp8P3adMt73WS_qncbc-XeZXhlUkOvZ/view?usp=drive_link
xHF	1 (transceiver + antenna + deployment)	https://drive.google.com/file/d/10pHUgJZQ0ffOTEJop7IOWpALXKSFdb4V/view?usp=drive_link
sBand	1 (transmitter + antenna)	https://drive.google.com/file/d/1OSMSd18MtjGfuTKE5h5OZoHbKJMS71Rg/view?usp=drive_link
HDRM	2 (only for deployable solar panel)	https://drive.google.com/file/d/1aLu7wtXMpOJksobiQRaJAnzKra2ebRoE/view?usp=drive_link
HyperMagCoil	3	https://drive.google.com/file/d/1w8q79hn0jJz7kQHQm46WVevvL33OC1Ru/view?usp=drive_link

1.2 Technical Specifications

The following table outlines the key technical specifications of a 30 kg, 226.3 x 226.3 x 454 mm custom micro satellite bus.

Satellite Bus	30 kg MicroSat (Up to 50kg)
Mass	11 kg (dependent on subsystems and dimensions of the bus)
Dimensions (stowed)	226.3 x 226.3 x 454 mm (configurable)
Peak Power generated	28 W and up (body mounted panels only) (dependent on dimensions of the bus for panel area)
Battery	200 Wh with Li-ion pack (configurable with addition of battery packs)

Bus Voltage	3.3V, 5V, 12V, Battery raw
Pointing Knowledge	<0.0125° (1σ)
Pointing Accuracy	<0.025° (1σ)
GPS Accuracy (optional subsystem)	PPS accuracy 20 ns Position accuracy 12 m (3σ) Velocity accuracy 0.9 m/s (3σ)
Slew Rate (30mNms reaction wheel assembly)	3 deg/s on each axis 1.2 deg/s simultaneous on all three axes
Encryption	AES-256-GCM/CBC (On-board)
Design Life	1 year (without propulsion)
Payload	
Mass	13 kg and up (configuration dependent)
Envelope	12U and up (configuration dependent)
Power for payload (peak)	80 W (configurable) (dependent on battery capacity)
Payload Interface	
Data	I2C/CAN/SPI/UART/Ethernet
TMTC	UHF/VHF
Power	3.3V, 5V, 12V, Battery raw
Payload Data Transmission	5Mbps (S-Band)
Data Storage	up to 2 TB

Testing & compliance	T-Vac	2 Cycles with temperature range of -25℃ to +60℃
	Vibration	Random vibration acceptance test levels 20 - 2000 Hz at 4.47grms for 60 seconds
	Shock	100 Hz at 20g 1000 Hz at 1000g 5000 Hz at 1000g