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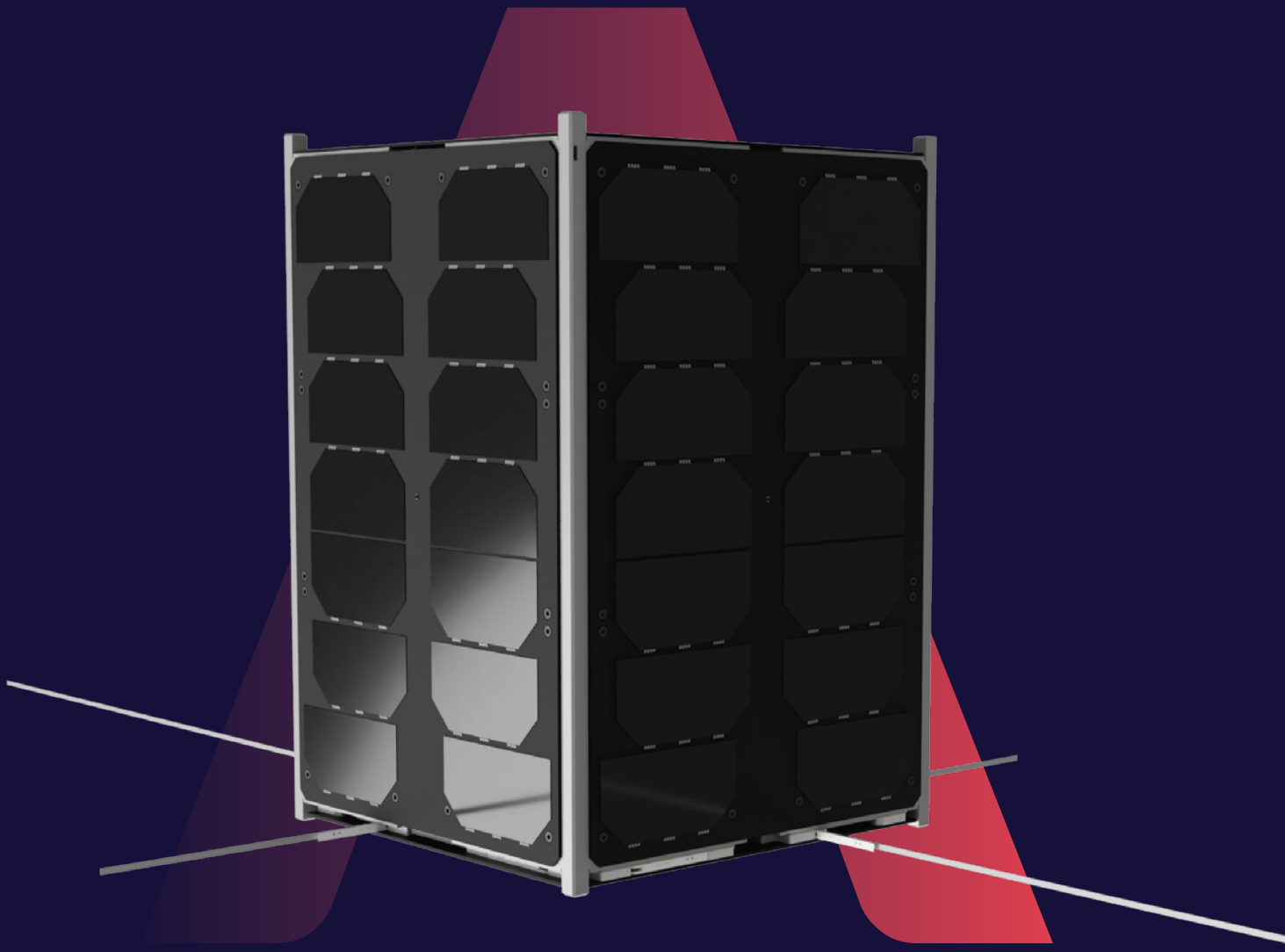

# Corvus
# 12U Nanosatellite Bus

ALSO 1-12U NANOSATELLITES AS A SERVICE

Built with flight proven Plug&Play components

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# Service overview

MISSION

**SATELLITE AS A SERVICE**

Solution for our customers.

## MISSION DESIGN

- Mission requirements analysis
- Satellite configuration
- Technology tailoring
- Orbit prediction and determination

## DEVELOPMENT

- Conceptual design
- Systems engineering
- CAD drafting
- PCB design
- Onboard SW development

## TESTING AND GSE

- Integration
- Vibration tests
- T-VAC tests
- Radiation testing
- Antenna characteristics measurement
- Magnetometer calibrations
- Ground station services


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# Service overview

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## LAUNCH CAMPAING MANAGEMENT

- Defining mission parameters
- Defining launch schedule and window
- Paperwork administration
- Satellite frequency coordination

## WE HAVE THE ANSWERS TO ALL YOUR QUESTIONS

- Where is my CubeSat right now?
- What observations happened today?
- What was the signal received during a particular observation?
- What are the actual data received (result of signal interpretation)?

## GROUND STATION SERVICES

- We are running our own ground stations in Central Europe and operate several others.
- Tracking satellites with accuracy better than 0.1 degree.
- Own decoding software which allows for clear display of telemetric data from individual systems.


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# How to book a mission?

1. **INITIAL INQUIRY**
When you are ready to embark on your satellite mission, the first step is to reach out to us.

2. **REQUIREMENTS GATHERING**
We will schedule a consultation to understand your mission requirements.

3. **PROPOSAL AND QUOTATION**
Based on your requirements, we will provide a detailed proposal with cost estimates and options.

4. **CONTRACT AND AGREEMENT**
Contract covering all aspects of the project for your review and signature.

5. **DESIGN AND ENGINEERING**
Collaborate with our experts to finalize the CubeSat's design, subsystems, and specifications.

6. **PRODUCTION AND ASSEMBLY**
We will begin the production process, keeping you updated on major milestones and progress.

7. **TESTING AND QUALITY ASSURANCE**
Rigorous testing ensures your CubeSat meets all requirements.

8. **DOCUMENTATION COMPLIANCE**
We will assist you in obtaining necessary licenses and provide comprehensive documentation.

9. **DELIVERY AND LAUNCH**
We will handle logistics and launch of your CubeSat.

10. **SATELLITE OPERATION**
We offer ongoing support for on-orbit operations, troubleshooting, and maintenance services.

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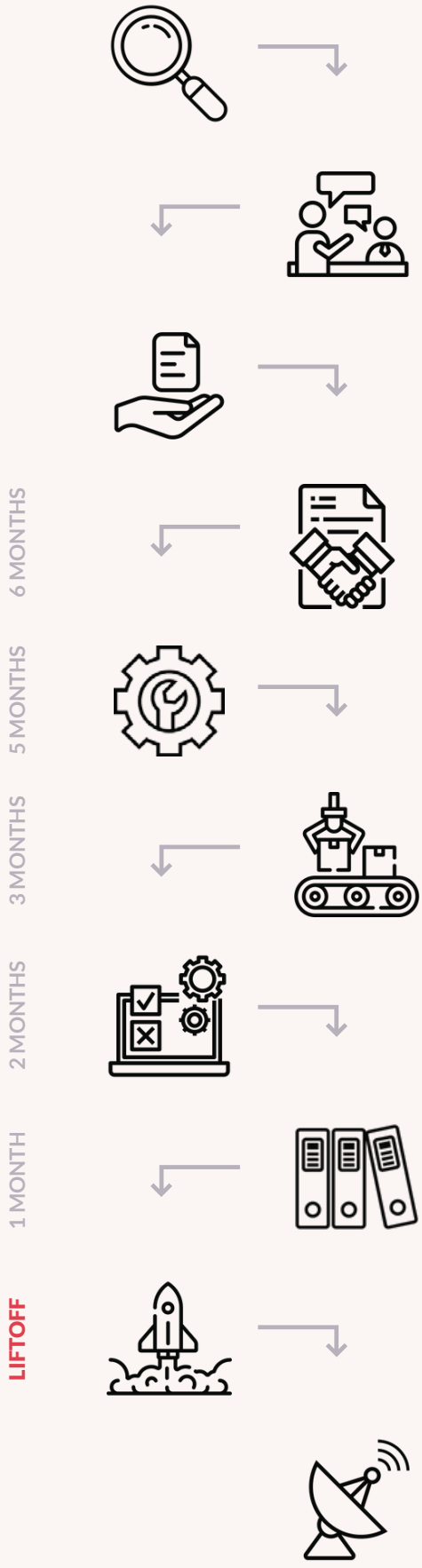
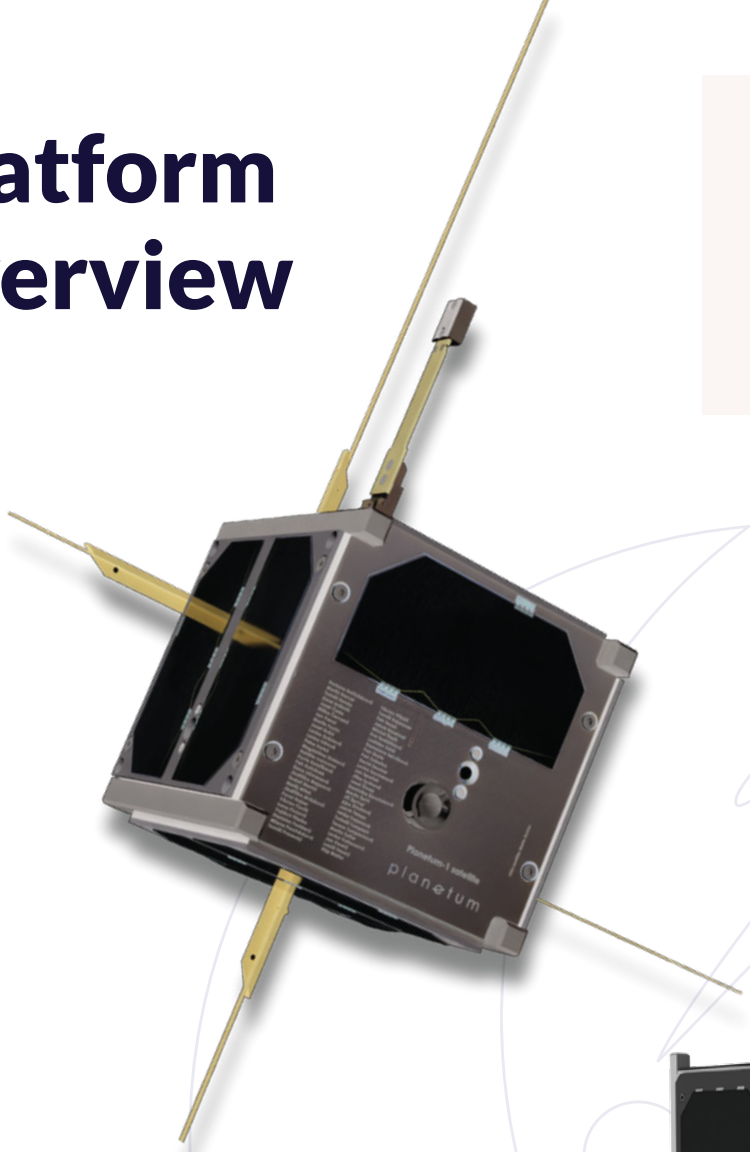
ROADMAP [T MINUS]



# Platform overview

**MOST ADVANCED NANOSATELLITE PLATFORM ON THE MARKET**




## DESIGNED FOR

- Complex tasks like in orbit object tracking
- Scientific research missions
- Technology IOD and IOV missions
- Commercial constellation missions
- Weather and climate monitoring
- Military purposes

## CUBESAT STRUCTURE

- Designed for easy integration and versatility
- Multiple PCB stack configurations
- Flexible payload volume
- Compatible with modern CubeSat deployers

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# CORVUS Specifications

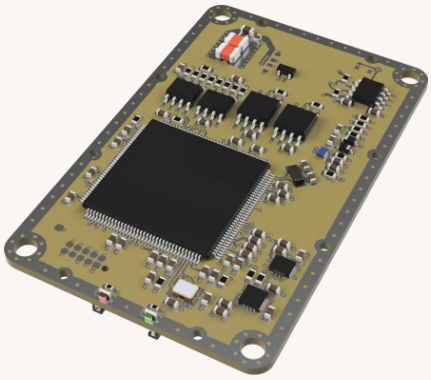
## GENERAL FEATURES

- Total empty bus mass: below 12 kg depending on configuration
- Payload volume: up to 10U (+ 4x TunaCan)
- Corvus bus is already pre-integrated and qualified. The platform is ready to be immediately used for payload Integration.

## CDHS
## DEEP THOUGHT + EDDIE

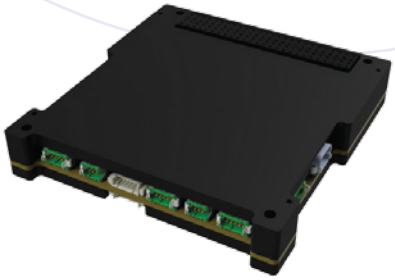
### Deep Thought

- ARM 32-bit Cortex™ M7 CPU with clock speed up to 300 MHz (configurable)
- 128 MiB Flash data storage
- Multiple sensor interfaces (SPI, I2C, UART, etc.)
- Procedure planning and scheduling



### Eddie

- MSP430 16-bit RISC based MCU
- 3 MiB FRAM data storage
- Platform telemetry logging
- Multiple sensor interfaces (SPI, I2C, UART, etc.)
- Procedure planning and scheduling



## PAYLOAD CONTROLLER

- Zynq® featuring ARM Cortex™-A9 processor mated with Artix®-7 based programmable logic
- 2x Cortex-A9 CPU core (up to 1GHz)
- 1GB RAM
- 16GB internal storage
- Optional external storage up to 480GB
- PC/104; 2x CAN, 2x I2C, power, PPS, SpaceWire (up to 200 Mbps), 2xLVDS (5 pairs, 4 pairs); USB 2.0 with OTG support, 3x RS-422, 3x RS-485, SPI, UART

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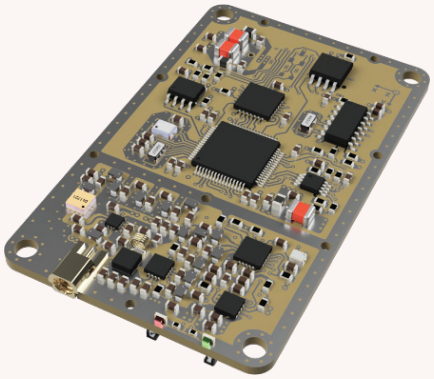
# CORVUS Specifications

## COMMUNICATION

### Murgas

- UHF/VHF Transceiver 400 MHz Band (amateur 420-450MHz and 144-148MHz)
- Bit rate: 0.1-38.4 kbps
- Receiver sensitivity -120 dBm
- Modulation: GFSK, CW
- Regulated power output: 1.0 W

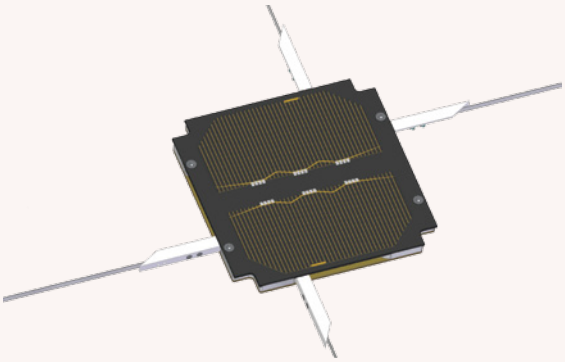


### Antenna Board

- UHF Antenna
- Low-profile Antenna Board (compact and lightweight)
- Type - Omnidirectional

### Full-Duplex S-band Transceiver

- RX frequency range: 2025 - 2110 MHz
- TX frequency range: 2200 - 2290 MHz
- RX bit rate: 128 kbps
- TX bit rate: 512 kbps
- Receiver sensitivity -104 dBm (<1% PER)
- Modulation: GMSK
- Full-duplex transmit and receive: 5.0 W
- High-speed downlink




## POWER SUPPLY UNIT

Outputs (over-current protected):

- 2 fixed voltage rails: 3.3 V; 5 V
- Up to 6 regulated configurable: 3.3 V / 5 V / 12 V
- Typical output channel current: 4 A

Batteries:

- 7.4 V, 40-100 Wh

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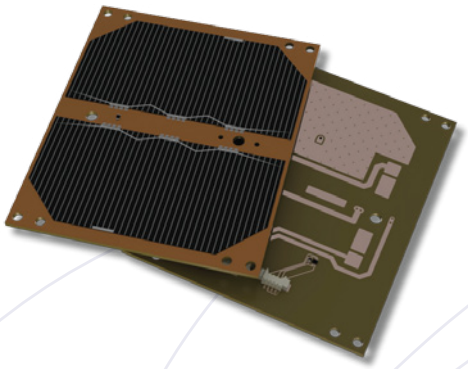
# CORVUS Specifications



## SOLAR PANELS RA

Triple Junction GaAs Solar Cell in series configuration

- 30% efficiency
- Options for sensor and interface tailoring
- LEO rated at 2.3 Watts (1U side panel)
- Up to 14 cell 6U configuration
- Custom design with different cell layout, sensor mounts

## AOCS

- Inertial and Magnetic Sensors System
- Sun Sensors
- Star Tracker
- IMU
- Reaction Wheels - 4
- Magnetorquer
- SW, automatic calibration
- Attitude pointing accuracy: up to ±0.1°
- Attitude pointing knowledge: up to 0.05°
- Stability accuracy (Jitter): ± 0.004°/s (at f > 4 Hz)
- Attitude manuever ability (Slew rate): up to 5°/s

**Operational modes:**

- Sun pointing mode
- Nadir pointing mode
- Velocity pointing mode
- Ground geodetic coordinate pointing mode
- Client defined pointing mode

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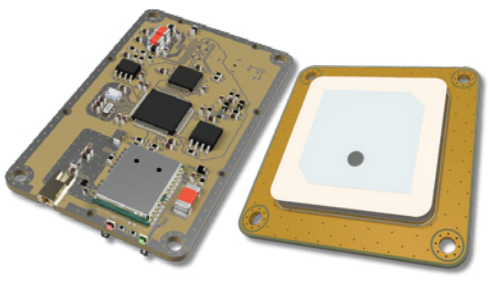

## GPS SYSTEM CELESTE

- GPS/Galileo/GLONASS/BeiDou
- Maximum velocity 10km/s
- -148dBm cold start sensitivity
- -165dBm tracking sensitivity
- 29 seconds cold start TTFF
- 1 second hot start
- 2m CEP accuracy

# CORVUS Specifications

## UMBILICAL CONNECTOR

- Main satellite communication bus
- PSU reset
- Battery charging
- Fake solar input
- Remove before flight element

## PROPULSION SYSTEM

- Optional

## SOFTWARE

Satellite platform software implements CubeSat Space Protocol (CSP) on internal communication buses. Subsystems implement plain text command line interface for parameter configuration and development on debug ports and over a CSP port.

The included software products include:

- CDHS software for platform telemetry logging and interface
- COM UHF interface and parameter configuration
- COM UHF deplyoable antenna interface
- COM S-band interface and parameter configuration
- PSU interface and parameter configuration
- AOCS interface for operation and parameter configuration
- GNSS interface and parameter configuration

Optional payload computer system is provided with basic example software interfacing the satellite bus without any specific functionality.

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## NEED A RIDE?


## Contact us

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WWW.SPACEMANIC.COM