

SATELLITE WAR

DESIGN • COMMUNICATE • SURVIVE

Official Competition Rule Book & Technical Specifications

01. THE MISSION TASK

Participants are required to build a fully autonomous satellite node. This system must utilize a designated microcontroller and sensor array to establish a reliable communication link with the organizer's Ground Station.

- Phase I: Build a functional satellite node with specified sensors.
- Phase II: Establish an autonomous handshake with the organizer's terminal.
- Phase III: Maintain a telemetry stream under simulated mission duress.

02. SYSTEM ARCHITECTURE



MANDATORY HARDWARE SPECIFICATIONS

3.1 FLIGHT CONTROLLER

Teams must select exactly ONE from the following:

- Arduino Uno / Nano
- ESP32 (Recommended)
- STM32 (Blue Pill or Equivalent)

Note: Raspberry Pi and OS-based SBCs are strictly forbidden.

3.2 RF MODULE

All communication must occur via:

- LoRa (SX127x series only)

Strict bi-directional capability is required for the handshake protocol.

3.3 MANDATORY SENSOR ARRAY

Every satellite node **must** include and transmit data from:

01.IMU	02.PRESSURE	03.ALITUDE	04. CURRENT
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SOFTWARE MISSION LOGIC

The satellite firmware must implement the following cycle autonomously:

- Handshake:** Locate and connect to the organizer's base station.
- Telemetry Stream:** Continuous transmission of all mandatory sensor data.
- Command & Recovery:** Respond to a **RESET** command sent from Ground Control. The system must reboot and re-establish the link without human intervention.

05. CREATIVITY HUB

Payload Design: Beyond the mandatory sensors, teams are encouraged to define a specific mission (Earth Observation, Disaster Monitoring, etc.) and add relevant sensors (Camera, Gas, Light).

Satellite Mimicry: Higher marks are awarded for mimicking real satellite behaviors such as power-saving safe modes, anti-jamming logic, or data encryption.

06. GROUND RULES

! NO LIVE CODING: No reprogramming is permitted at the venue once testing starts.

! NO HARDWARE MODS: Soldering or wiring changes are forbidden during the test window

! NO LAPTOPS: Testing is strictly autonomous. No serial monitor connection allowed .



LIVE EVALUATION & SCORING

CATEGORY	EVALUATION METRIC	MARK
Purpose & Payload	Mission clarity, real-world relevance, payload justification.	S 30
Functionality	Working hardware, autonomous operation, zero manual reset.	25
Communication	100% command reception, telemetry accuracy, protocol compliance.	25
Inspection	Physical build: Soldering quality, assembly, design skills.	10
Presentation	Architecture explanation, decision defense, and Q&A.	10
TOTAL POTENTIAL MARKS		100

08. TERMINATION (DISQUALIFICATION)

The following actions result in immediate mission failure:

- Live Code Editing or Hardware Rewiring during test.
- Manual Reset during the scoring window.
- Failure to comply with the fixed communication protocol.