

# CubeSat Development Platform



Kickstarting CubeSat development



## DESCRIPTION

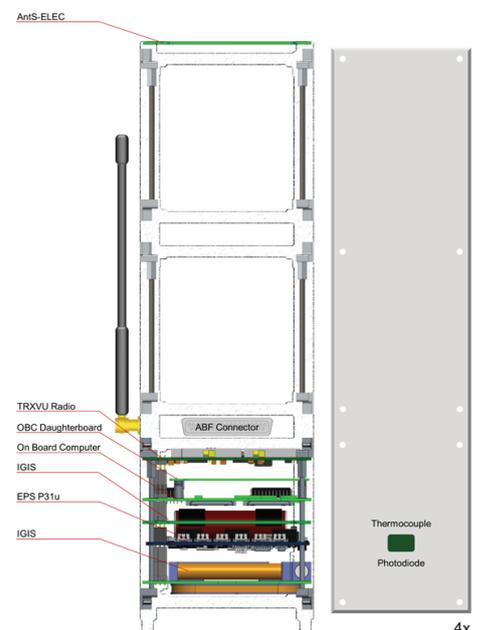
The Generic Engineering Model (GEM) has been developed with the aim of providing nanosatellite developers with a standard and integrated setup to jumpstart their payload and software development. Its accessibility and versatility also make it a relevant and affordable tool for educational and outreach purposes.

The GEM platform has an architecture based on the previous ISIS successful missions. It includes CubeSat subsystems with high heritage to provide a reliable and representative environment of development.

The work done on this bus can be easily implemented on a future or on-going Flight Model satellite project. Furthermore, the setup includes all required ground support equipment and software libraries for interfacing with the satellite.

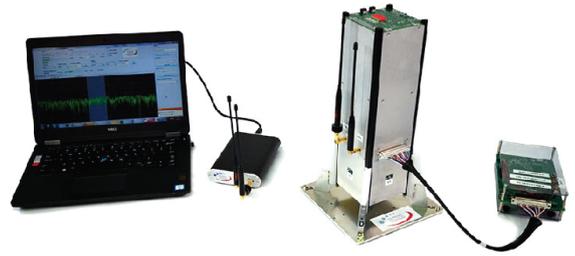
## CUBESAT SUBSYSTEMS

- Structure (ISIS 3U CubeSat structure)
- Side panels with integrated temperature and sun sensors
- ISIS On-Board Computer (iOBC), including EM Daughter Board
- ISIS Transceiver VHF uplink / UHF downlink (TRXVU)
- ISIS Magnetorquer Board (iMTQ)
- ISIS Antenna System Electrical Model (AntS-ELEC)
- Electrical Power System (EPS)
- ISIS Generic Interface System (IGIS)
  - Single connector generic satellite interface
  - Apply Before Flight (ABF) connector
- Payload interfaces
  - Data: UART (RS-232), I<sup>2</sup>C, SPI
  - Power: 3V3 and 5V
  - Mechanical: 2U stack



## GROUND SUPPORT EQUIPMENT (GSE)

- Communication GSE
  - RF Checkout box (Wireless satellite communication interface)
  - VHF/UHF Test Antenna (Uplink and Downlink)
  - Attenuator for connection to the satellite transmitter
  - Attenuator for connection to the RF Checkout transmitter
  - Electrical GSE
  - OBC Programming and Debug interface
  - Power Supply
- Mechanical GSE
  - Horizontal, Vertical and Stack integration support (MGSE set)
  - Tooling set



## SPECIAL DEDICATED EQUIPMENT

- **IGIS (ISIS Generic Interface System)** - The IGIS is a group of components that have been designed to provide a generic interface system to nanosatellites. A single EGSE connector is used to connect to the satellite during ground based testing and launch preparation as well as to “arm” the satellite for flight mode.
- **AntS Electrical Model** - The AntS Electrical Model is a functional reusable model of the AntS system that uses LEDs and jumpers to simulate and monitor the different states of the antennas.
- **Communication GSE** - The unit comes as a UHF/VHF transceiver compatible with ISIS low rate radio products in VHF and UHF. This product is perfect to emulate a ground station during end-to-end testing in the lab, at test sites or at the launch site.
- **Electrical GSE** - The EGSE and umbilical cord forms the ground side of the IGIS. It connects directly to the interface board on the satellite and allows testing and monitoring of the satellite hardware with basic laboratory equipment. It also allows battery management of the integrated satellite battery.

## SOFTWARE

### On-board

- FreeRTOS
- Hardware abstraction layer
- Subsystem interface library
- Demonstration software

### Ground PC

- IDE and debug terminal
- Radio GSE software and GUI

## OPTIONS

- Solar panel
- Advanced ADCS
- GEM demonstration workshop



This document is subject to change without notice. Latest information is on [www.isispace.nl](http://www.isispace.nl)



**ISIS - Innovative Solutions In Space B.V.**  
Motorenweg 23, 2623CR, Delft, The Netherlands  
T: +31 152569018  
[info@isispace.nl](mailto:info@isispace.nl)  
[www.isispace.nl](http://www.isispace.nl)

