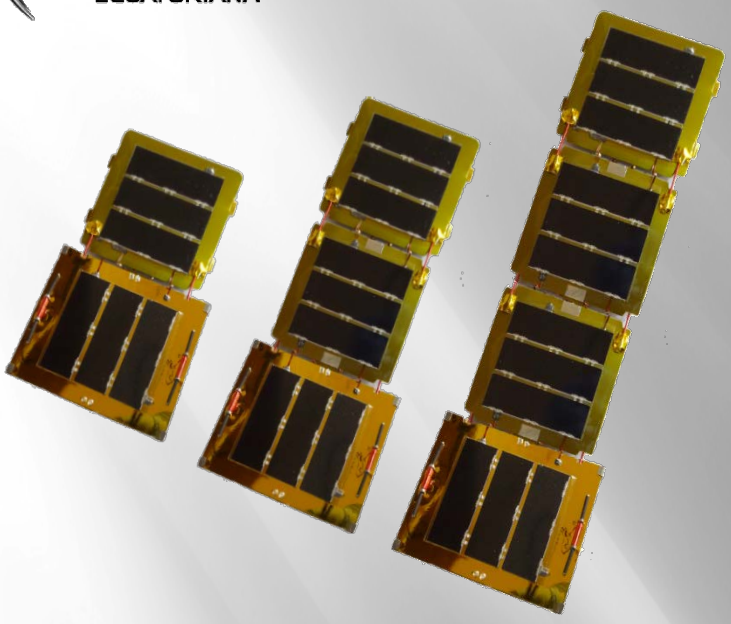
AGENCIA ESPACIAL CIVIL ECUATORIANA

DSA: 1U DEPLOYABLE SOLAR ARRAYS



Expand the limits of your 1U mission with our record-setting Deployable Solar Arrays (DSA) providing from 2.75W to 16.8W depending on the chosen solar cells and number of panel configuration.

Check this amazing video showing how our DSA release and deploy gently and flawlessly.

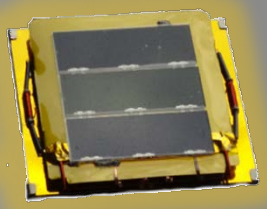
Our DSA are powered by our unique **Artificial Muscle Technology**, which is far superior than common thermal knife techniques. And proven in space…

FLIGHT HERITAGE

Our DSA has flight heritage since 2013 in 2 missions still in orbit and have been selected to fly in 3 more upcoming U.S. missions from 2017 to 2019. Three years now our first DSA is still in service.

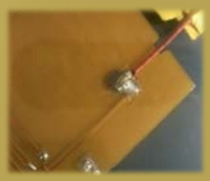
SUPER THIN

Fully compatible with ISIS and Pumpkin structures, they fold into Amazing 5.5 mm thickness, the thinnest solar array available.



POWERED BY ARTIFICIAL MUSCLES

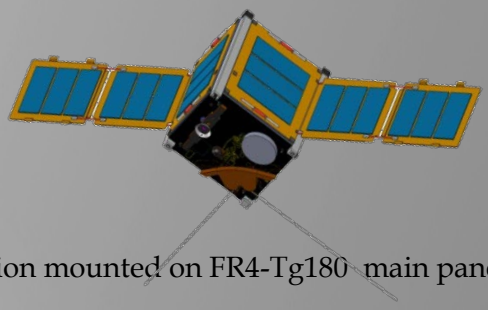
Our unique **AMT** Artificial Muscle Technology allows for a gentle, safe and repeatable (unlike thermal knife systems) release and deploy both on ground (for testing) and in orbit.



PROTECTED BY NEMEA SHIELDING

Our unique thermal regulating, anti-EM, anti-radiation NEMEA MLI shielding lets you use COTS components inside your cubesat allowing a 10-fold cost reduction on your mission's financial budget. We take care of the space environment so you can focus on your mission.

DSA: TECHNICAL INFORMATION (1)



FEATURES

- Gentle release and deploy with artificial muscles
- Sturdy Titanium CP-2 scaffold, 99.8% pure.
- Release in 19 seconds, Deploy in 10 seconds, no backlash
- Reflective NEMEA layer-0 Anti-VUV and thermal protection mounted on FR4-Tg180 main panel
- Heritage, robust diodes installed by default
- Includes Release and Deploy contact sensors
- Sun sensors and temperature sensors on demand
- Custom titanium harnessing included
- Manufactured according to space standards and custom mission design
- Functional, performance, thermal bake out and vibration tests provided with documentation.
- Very thin, 5.5mm folded, each panel is only 1.5mm thick
- Compatible with ISIS and Pumpkin Structures
- Ready to integrate to your 1U structure and fully compliant to CubeSat Standard
- Compatible with QuadPack and ISIPOD Launch Adapters
- Customizable electrical and data interface

PROPERTIES

Mass (depends on configuration)		
Panels	w/NEMEA	w/o NEMEA
1	67g	57g
2	115g	87g
3	135g	107g

Folded Configuration Thickness		
Panels	w/NEMEA	w/o NEMEA
1	5.5 mm	3.5 mm
2	7.5 mm	5.5 mm
3	8.5 mm	6.5 mm

Deployable Panel Thickness: 1.5 mm

Operating Temperature:
-80 to +130°C

Radiation Tolerance:
2 years minimum in LEO
4 years minimum with NEMEA shielding

PERFORMANCE

Supplied Voltage@Current and Power:
Condition full sunlight in LEO

Low cost solar cells:			***@BOL***
Panels	Top	Bottom	Array Power
1	3.6V@0.5A	1.8V@0.5A	2.75W
2	5.2V@0.5A	3.2V@0.5A	4.30W
3	7.2V@0.5A	5.2V@0.5A	6.25W

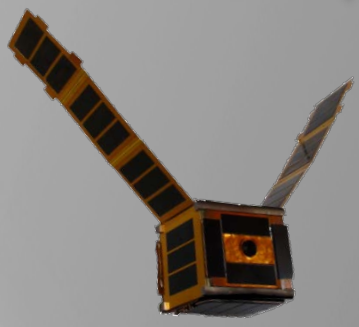
***High power AzurSpace 3G-30*:**			***@BOL***
Panels	Top side	Bottom side	Array Power
1	9.6V@0.5A	4.8V@0.5A	7.2W
2	14.4V@0.5A	9.6V@0.5A	12W
3	19.2V@0.5A	14.4V@0.5A	16.8W

Protection:
2A@20V Schotky diodes integrated

Cell Efficiency:
30% (High power) or 19% (low cost)

Release/Deploy:
Release in 19 seconds using 152 joules
Deploy in 10 seconds using 52 joules

DSA: TECHNICAL INFORMATION (2)



MATERIALS

Panels:
- Side panel: FR4-Tg180
- Deployable panels: Titanium CP2 99.8% pure, 0.25mm thick

Shielding:
- Side panel: NEMEA layer 0 Anti VUV, thermal isolation
- Deployable panels: Kapton 2 mils

Harness: Titanium CP2 0.5mm

Contact sensors: Cu spring, Silver plated

Actuators:
- Deploy: EXA MDH/R2, 30 grams max torque artificial muscle strand
- Release: EXA MDR/R1C, 50 grams max torque artificial muscle strand

Cell Material: GaAs (High power) or mono crystalline Silicon (low cost)

Cell Interconnector: Invar Silver plated

Interfaces: Custom choice, normally 3 Molex PicoBlade inline 4 pin connector with gold plated contacts. PTFE (Teflon) space grade cables, single strand, silver plated copper (AWG26, AWG24 and AWG30)

TESTING and QUALITY

All panels are provided with tests reports regarding:

- Continuity isolation between cells and substrate
- No cracks warranty
- Thermal Bake out (10E-7 mbar @ 50C for 24 hours)
- Full vibration test for Dnepr and Long March 2D

TEST	QT	AT
Functional	✓	✓
Vibration	✗	✓
Thermal Cycling	✗	✓
Thermal Vacuum	✗	✓
Continuity Isolation	✓	✓
Solar cells Cracks	✓	✓
Flasher Test	✓	✓
Performance	✓	✓

QT and AT are performed on the unit to be shipped

CUSTOMIZATION

Each DSA is tailored to the mission needs with customer's choice of connectors, harness, solar cells, shielding and panel count configuration. Detailed blueprints, 3D PDFs, STEP and SolidWorks files can be provided on demand.

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