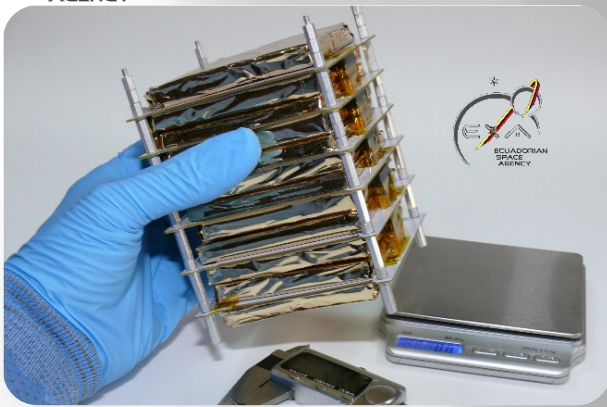




# TITAN: 350Whr Modular Power Array

The EXA TITAN is a 1U-sized power bank module built from 7 battery arrays designed to provide the highest energy capacity and redundancy: Its power capacity is 50 Whr per battery module, giving a total of 350 Whr. For missions from 3U Cubesats to Microsatellites.

TITAN enables your system to perform longer and better and pack as much power as a microsatellite configuration. All our batteries are fully customizable to your mission's need in terms of output, cable, connectors or interfaces.



## FLIGHT HERITAGE

TITAN is the design advancement of the BAOx line, which has flight heritage since 2013 in 6 missions in orbit and have been selected to fly in 10 more upcoming U.S. missions from 2020 to 2029.

## HIGH ENERGY DENSITY

TITAN packs 350Whr and 84000mAh in a 1U package, delivering ultra-high power from 3U+ CubeSats to Micro Satellites.

## SCALABLE AND USER CONFIGURABLE

Our batteries can be connected in series or parallel between them and the output is user configurable on each battery to supply 4.2V or 8.4V depending on the user needs. More voltages are available up to 52V and more modules can be connected for more power.

## REUSE YOUR OWN HEAT

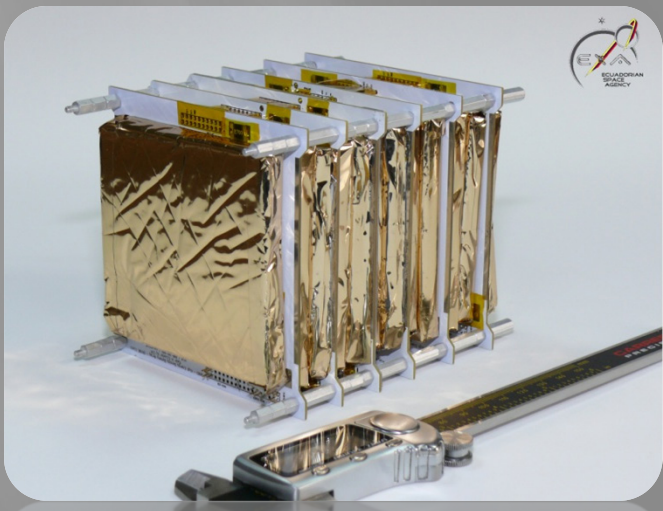
Our unique Thermal Transfer Bus based on carbon nanotubes and graphite allows you to route the waste heat from your electronics and use it to warm your batteries without using active heaters and at the same time cooling your payload. The combination of graphite and lithium in the batteries also turns them into an excellent radiation shields, protecting your electronics from harsh radiation environment, allowing a 10-fold cost reduction on your mission's financial budget.

## PROPERTIES

Mass (depends on configuration)		
Model	Mass	# of Cells
Total	1050g	56
Module	150g	8

## PERFORMANCE

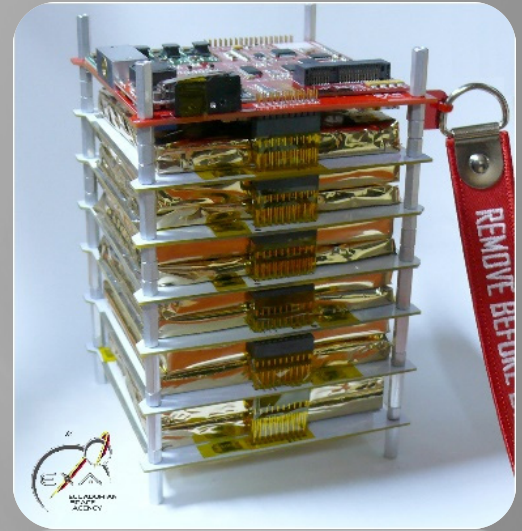
Performance:			@BOL
Model	Voltage (max)	Current	Power
Total	4.2/8.4V	84/42Ah	350Whr
Module	4.2/8.4V	12/6Ah	50Whr



# TITAN: TECHNICAL INFORMATION

## HIGHLIGHTS

- High Energy Density: 350Whr in a 1U package
- Powerful: Can power from 2U to 24U missions
- Unique containment technology prevents swelling in vacuum
- Configurable: As serial or parallel (4.2V or 8.4V).
- Other voltages available upon request up to 52V
- Multiple redundant cells ensures mission survivability
- Multiple BADx modules can be link-chained to expand power capabilities.
- Designed for LEO missions and requirements and beyond.
- Stand alone charge port, overcharge and undercharge built-in protection
- Made from BADx battery modules with **flight heritage (TRL-9)** since 2013
- Manufactured with space grade materials according to space standards and custom mission design
- Functional, performance, thermal bake out and vibration tests provided with documentation.
- Compatible with ISIS and Pumpkin Structures and compliant to CubeSat Standard
- Charging cables provided by default and custom Interface available



The TITAN shown installed as a part of the COLOSSUS core

## FEATURES

### Typical internal resistance:

1 to 7 milliohms @ 25°C, Total impedance < 50 milliohms

### High discharge rate:

2C @ 30 mins, 4C @ 10 mins, 10C @ 2 seconds

### High speed charge rate:

2 times the nominal capacity

### Operating Temperature:

-30 to +80°C w/o CN/TTB option

-60 to +120°C w/ CN/TTB option

### Radiation Tolerance:

2 years minimum in LEO, 10 years if S/C has NEMEA shielding

### Outgass data: TML < 1%, CVCM < 0.05 %

### Interface: Normally Molex PicoBlade/PicoSpox

inline 2 pin/4 pin connector with gold plated contacts or Samtec multi pin gold coated interface,

PTFE (Teflon) space grade cables, single strand, silver plated copper (AWG22 to AWG24)

## QUALITY CONTROL

TESTS	QT	AT
Functional	Yes	Yes
Vibration	No	Yes
Thermal Cycling	No	Yes
Thermal Vacuum	No	Yes
Cable/Conn. Integrity	Yes	Yes
Conn. polarity	Yes	Yes
Freezing/Overheating	Yes	Yes
Performance	Yes	Yes

QT and AT are performed on the unit to be shipped

## CUSTOMIZATION

Each TITAN is tailored to the mission needs with customer's choice of cables, connectors, harness, shielding and output. Detailed blueprints, 3D PDFs, STEP and SolidWorks files can be provided on demand.

## CONTACT US:

Email: [info@exa.ec](mailto:info@exa.ec)

Web: <http://exa.ec>

Twitter: [https://twitter.com/EXA\\_ec](https://twitter.com/EXA_ec)

Facebook: <https://www.facebook.com/AgenciaEspacialEcuatoriana/>

LinkedIn: <https://www.linkedin.com/company/ecuadorian-space-agency>

Cdla Nva Kennedy , Calle C #130

Guayaquil - Ecuador

Phone: +593-999-429106

Fax: +593-42-836098