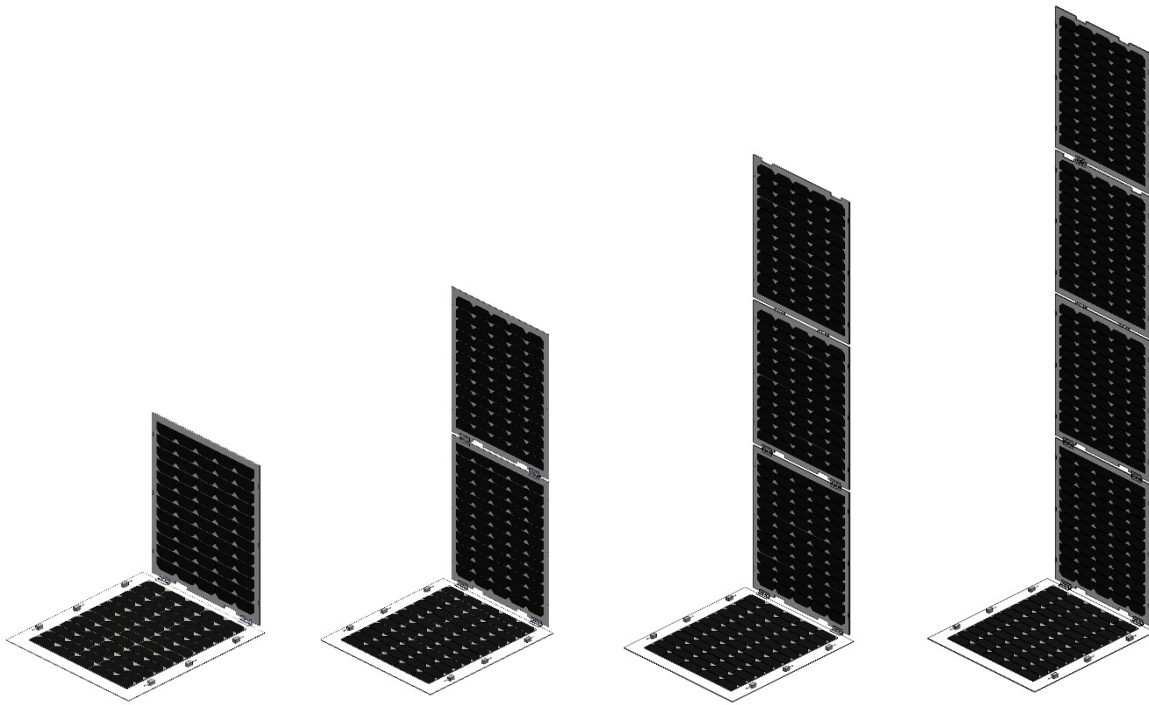


# DMSA Micro: Deployable Multifunction Solar Array



## PRODUCT NAME

DMSA Micro: Deployable Multifunction Solar Array with embedded antennas, magnetorquers and sensors

## SUMMARY

The EXA DMSA Micro (Deployable Multifunction Solar Array for Microsatellites) is the upscaled version of the latest DMSA line, it is one our answer to microsatellite sized products of a family of deployable solar arrays based on artificial muscles for CubeSats. The arrays fold into a panel attached to the CubeSat structure just as another solar panel and once in orbit it deploys to full extension, it includes deploy and release contact sensors and its own deploy control board.

Now, in a world's first, it includes embedded antennas that range from VHF to L band, no longer you need to buy and manage antenna systems, the DMSA has them embedded in its structure as 2 monopoles or 1 dipole and they deploy with the solar array, you just connect the cable to your radio.

It also has an embedded magnetorquer, sun and temperature sensors. These solar panels feature a very high efficiency for very high-power missions; the maximum folded thickness is 19.5 mm for the 4-panel



array. Every array is tested and qualified in our own facilities and shipped with full reports, the DMSA Micro yields the best results when coupled with our high-capacity batteries.

## FEATURES

- Heritage release with artificial muscles, spring operated deploy
- Release within 5 seconds, Deploys immediately
- Embedded antennas can be configured as 2 monopoles or 1 dipole, frequency range from VHF to L-band
- Includes Release control board and contact sensors
- Sun sensors and temperature sensors embedded
- Designed for LEO missions and requirements
- Manufactured according to space standards and custom mission design
- Functional, performance, thermal bake out and vibration tests provided with documentation.
- 19.5 mm max when folded, each panel is 3mm thick
- Discounts for complete mission sets
- Compatible with ISIS and Pumpkin Structures
- Compliant to CubeSat Standard
- Compatible with QuadPack and ISIPOD Launch Adapters

## PERFORMANCE

- Supply Voltage (depends on configuration):
  - 4.5V to 5.2V top side
  - 3.2V to 3V bottom side
- 2A@20V Schotky diodes integrated
- Power Delivered:
  - Condition full sunlight in LEO: 150 W minimum
- Cell Efficiency: 28%
- Release within 5 seconds
- Deploys immediately
- Embedded Antennas:
  - Band Range: VHF to L-band
  - Gain:
    - Monopole configuration = 2.1 dB max
    - Dipole configuration = 3.1 dB max
    - Extended Monopole = 2.3 dB max
  - Lambda: from 1/4 to full wave
  - Connectors: User defined
  - Cable: RG316 or User defined
- Sun Sensor:
  - Analog, GPIO, 5 to 16V

- Linear response range from 0.2V to 5V
- Working current: 50 mA
- Working FOV: 65 degrees H/V
- Temperature sensor:
  - Analog, GPIO, 4 to 12V
  - Linear response range from 0.3V to 1.5V
  - Working current: 80 mA
  - Working temperature: -65 to 135C

## PRODUCT PROPERTIES

- Mass (exact mass depends on configuration):
  - 1 panel: 3870g
  - 2 panels: 5750g
  - 3 panels: 7630g
- Panel Thickness:
  - Folded:
    - 1 panel: 10 mm
    - 2 panels: 13 mm
    - 3 panels: 16 mm
    - 4 panels: 19.5 mm
  - Unfolded: 3 mm
- Deploy/Release control board included, TTL 3.3 or 5V operated
- Operating Temperature: -80 to +130°C
- Radiation Tolerance: 4 years minimum in LEO

## MATERIALS

- Panels:
  - Side panel: FR4-Tg180
  - Deployable panels: FR4-Tg180 3mm thick
- Contact sensors: Deploy and Release
- Actuators:
  - Deploy: Spring operated
  - Release: EXA MDR/R1C, 50 grams max torque
- 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)

## TESTING

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 Falcon 9, Electron, Soyuz, Dnepr and Long March 2D
- QT and AT is performed on the unit to be shipped

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

## CONFIGURATIONS

- Panel Array – deploys as 3 panels (2 on top side, 1 on bottom side): 84000€
- Panel Array – deploys as 5 panels (3 on top side, 2 on bottom side): 168000€
- Panel Array – deploys as 7 panels (4 on top side, 3 on bottom side): 252000€
- Panel Array – deploys as 9 panels (5 on top side, 4 on bottom side): 336000€

## EXTRA OPTIONS

- Integrated NEMEA Anti-Radiation, Thermal Regulation MLI shield (EM, Gamma, X-Ray, Alpha, Beta, L-neutron): 6000€
- Coarse Sun Sensor – Vishay: 500€
- Embedded UHF/VHF Antennas: 6000€