

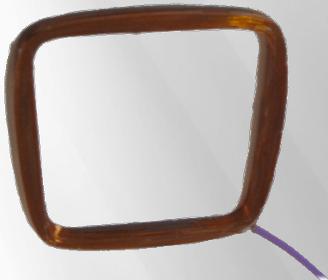


# MT01: COMPACT MAGNETORQUER

With only 7.5 grams and 3.2 millimeters thickness, the MT01 Compact Magnetorquer is a vacuum core magnetic coil designed for ADCS control in cubesat missions from 1U to 3U that boast an impressive performance compared to its small footprint over the mass, power and area budget of the spacecraft.



Even with those small dimensions the MT01 is capable of greater magnetic moments, turn speeds and angular accelerations than comparable products on the market, yet the power usage is kept to a minimum: It can turn a 1U mass 90 degrees in 60 seconds using only 0.2 Watts at a LEO orbit of 500kms.



MT01 can be integrated in to our BA0x family of high capacity compact batteries and our DSA Deployable Solar Array family too, the biggest advantage of the MT01 is that it can be easily affixed anywhere on your spacecraft using a minimal area.

Every coil is tested and qualified in our own facilities and shipped with full reports and packed with additional match connectors interfaces.

## PERFORMANCE

- Working Voltage:** From 1.25V to 7.5V
- Working Current:** From 100mAh to 2000 mAh
- Nominal Magnetic Moment:**  $>0.19 \text{ Am}^2$
- Saturation Magnetic moment:**  $>0.85 \text{ Am}^2$
- Linearity:**  $\pm 4\%$  across operating design range
- Residual moment:**  $<0.0045 \text{ Am}^2$
- Torque:**  $5.36 \mu\text{Nm}$  @  $7.2^{-3} \text{ Tesla}$  (1U mass)
- Angular acceleration:**  $3.2^{-3} \text{ Rad/sec}^{-2}$  (1U mass)
- B-center** = 8.9 Gauss
- B-corners** = 14.5 Gauss
- Supply Power:** From 250mW to 1750mW
- Typical resistance:** 4.1 to 4.7 ohms @  $25^\circ\text{C}$
- Random Vibration:** 16g rms
- Lifetime:**  $>10$  years

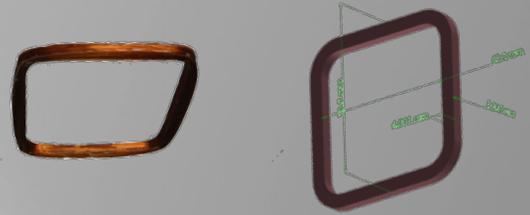
## FLIGHT HERITAGE

Our magnetorquers have flight heritage since 2013 in 4 missions still in orbit and have been selected to fly in 10 more upcoming U.S. missions from 2017 to 2029.





# MT01: TECHNICAL INFORMATION (1)



## HIGHLIGHTS

- Low cost, proven standard
- Very thin and lightweight: only 3.2 mm thick at 7.5 grams
- Compact, power efficient, yet powerful magnetic dipole strength: Up to 0.39 Am<sup>2</sup>
- Fast 5.90 degrees per second turn speed (at max power, 1U mass) optimizes power usage
- Perfectly coupled with our DSA Deployable Solar Arrays or BA0x batteries
- **Flight heritage from** NEE-01 PEGASUS, NEE-02 KRYSAOR, IRVINE01 and IRVINE02
- Manufactured with space grade materials according to space standards and custom mission design
- Functional, performance, thermal bake out and vibration tests provided with documentation.
- Extensive documentation as 3D pdf, STEP files and blue prints
- Compatible with almost any structure and compliant to CubeSat Standard
- Custom Interface available

## PROPERTIES

### Dimensions:

External: 50x50 mm  
 Internal: 42x42 mm  
 Width: 4.3 mm  
 Height: 3.2 mm

### Mass: 7.5 grams

### Operating Temperature: -55 °C to +85 °C

**Radiation Tolerance:** 2 years minimum in LEO,  
 4 years minimum when the S/C has NEMEA  
 shielding

## MATERIALS

Pre-evacuated enamel copper wire

**Cohesion:** Space grade epoxy 3M

**Interfaces:** Custom choice, normally Molex

PicoBlade/PicoSpox inline 2 pin connector with gold plated contacts. PTFE (Teflon) space grade cables, single strand, silver plated copper (AWG26 to AWG30)

## QUALITY CONTROL

TESTS	QT	AT
Functional	✓	✓
Vibration	✗	✓
Thermal Cycling	✗	✓
Thermal Vacuum	✗	✓
Cable/Conn. Integrity	✓	✓
Continuity	✓	✓
Freezing/Overheating	✓	✓
Performance	✓	✓

QT and AT are performed on the unit to be shipped

## CUSTOMIZATION

Each MT01 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:

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