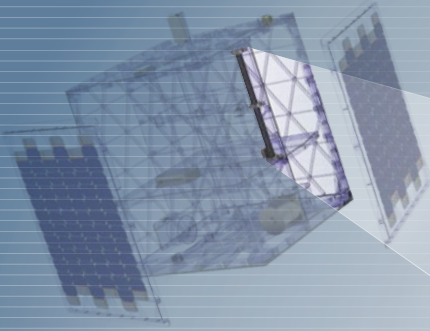


# MAGNETORQUER ROD



## PERFORMANCE

	NCTR-M003	NCTR-M012	NCTR-M016	NMTR-X [Custom]
<b>FUNCTIONAL CHARACTERISTICS</b>				
Magnetic moment (nominal)	0.29 Am <sup>2</sup>	1.19 Am <sup>2</sup>	1.6 Am <sup>2</sup>	From 2 Am <sup>2</sup> up to 300 Am <sup>2</sup>
Linearity (across operating range)	<± 5%	<± 5%	<± 5%	<± 5%
Residual moment	<0.01 Am <sup>2</sup>	<0.01 Am <sup>2</sup>	<0.01 Am <sup>2</sup>	<0.3 at 100 Am
<b>PHYSICAL CHARACTERISTICS</b>				
Dimensions (l x w x h)	72 mm x 15 mm x 13 mm	94 mm x 15 mm x 13 mm	107 mm x 15 mm x 13 mm Excluding Connector: 70 mm x 15 mm x 13 mm	12 cm up to 75 cm
Mounting feet	2	2	2	2, 3 or 4 depending on length
Mass	<30 g	<53 g	<53 g	Approx. 30 g/cm length (12mm core)
Power (nominal)	<250 mW from 5 V supply	<800 mW nominal @ 5 V	<1.2W from 5 V supply	1 W / 50 Am <sup>2</sup> typical (Customisable)
<b>ENVIRONMENTAL CHARACTERISTICS</b>				
Thermal (acceptance)	-20 °C to +60 °C	-20 °C to +60 °C	-25 °C to +70 °C	-25 °C to +70 °C
Mechanical Tests (qualification)	21.06g <sub>RMS</sub> (random)	21.06g <sub>RMS</sub> (random)	21.06 g <sub>RMS</sub> (random)	21.06 g <sub>RMS</sub> (random)
Radiation (TID) (qualification)	n.a.	n.a.	n.a.	n.a.
<b>INTERFACES</b>				
Power supply	5 V <sub>DC</sub>	5 V <sub>DC</sub>	5 V <sub>DC</sub>	5 V <sub>DC</sub> - 28 V <sub>DC</sub> (Customisable)
Data	n.a.	n.a.	n.a.	n.a.
Connector	Molex Pico-Lock	Molex Pico-Lock	Molex Pico-Lock	9-way D-type male (micro-D on smaller rods. Dual pins per winding and redundant winding options available.  (Can be replaced by a Molex Pico-Lock)
Mechanical	4 x M2 Socket Head Cap Screws	4 x M2 Socket Head Cap Screws	4 x M2 Socket Head Cap Screws	6x M3 Socket Head Cap Screw

**ACCEPTANCE TESTING:** All FM parts undergo random vibration (10 rms) as well as thermal cycling (four cycle ambient pressure) to five degrees beyond operational thermal specifications. However, NewSpace can perform additional environmental testing if required by a client.

**CONFIGURATION MANAGEMENT:** Specifications are subject to change. Please refer to latest version.

# MAGNETORQUER ROD



## FEATURES

- High moment for low power
- Small size and low mass
- Very small residual magnetic moment
- Adaptable for size, moment and power to meet optimal system requirements
- Redundant windings available
- Simple interface

## APPLICATIONS

- Active damping for spin stabilised, momentum-biased and gravity-gradient-controlled satellites
- Momentum dumping of reaction wheels in three-axis stabilised spacecraft
- Simple magnetic stabilisation

## QUALIFICATION

The NSS magnetorquer rod designs are TRL 9 and have extensive in-orbit heritage. Some of the larger NSS magnetorquer rods were first flown in 2014 on the SaudiSat-4 and DX-1 missions. Since then, NSS has become one of the largest magnetorquer rod manufacturers in the world, having delivered more than 200 CubeSat Rods and 1000 MicroSat Rods to a variety of international missions and constellations, all with differing performance requirements. To date, this product has been baselined on three international constellations.

## UTILITY

Magnetorquers offer a method of controlling the attitude of a spacecraft either directly, by interacting with the local Earth's magnetic field or, more usually, in combination with reaction wheels. This secondary method allows for the dumping of excess momentum in the reaction wheels without the need for a complex propulsion system.

The NewSpace Systems (NSS) magnetorquer rods use a magnetic alloy rod which produces an amplification effect over an air cored magnetorquer. This allows a system that uses less power and is less susceptible to magnetic torque variations due to temperature.

Each rod is typically bifilar wound for redundancy, or the windings can be activated together to increase the torque produced. While drive circuits for the rods can be supplied if required, they typically run directly between a switched power output and the on-board power control system.