**CubeControl**

**Actuator and Sensor Interface Board**

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### Description

CubeControl is an actuator and sensor interface module for nanosatellites with advanced attitude control requirements. It is capable of controlling magnetorquers and a momentum wheel. It can also interface with magnetometers, coarse sun sensors, and rate sensors. The module can be configured to include any desired combination of actuators and sensors, depending on the mission requirements.

### Feature List

**Magnetorquers:**  
- On/Off control for improved linearity  
- Interface for 3 magnetorquers  
- On-board mounting of two CubeTorquer rods

**Momentum Wheel:**  
- PWM current control  
- Over-current protection  
- Brushless DC motor with vacuum-rated bearings  
- On-board mounting of CubeWheel Small; can also interface with Medium or Large (momentum wheels)

**Magnetometers:**  
- Active temperature compensation  
- Two magnetometer interfaces for redundancy  
- Interface for deployment mechanism

**Coarse Sun Sensors:**  
- Interface for up to 10 photodiode coarse sun sensors

**Rate Sensors:**  
- 3 orthogonal MEMS rate sensors mounted on-board

### Application

- For nanosatellites that require attitude control  
- Easily integrates with all CubeSpace components  
- PC/104 form factor, compatible with CubeSat standard

### Testing & Heritage

- Successful vibration & heated vacuum tests  
- Radiation test (TID)  
- Used on QB50 precursor satellites

### Specifications

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Operating voltage</strong></td>
<td>3.3 V / 5 V / $V_{bat}$ (6.4 V - 16 V)</td>
</tr>
<tr>
<td><strong>Power consumption</strong></td>
<td>220 mW (nominal)</td>
</tr>
<tr>
<td><strong>I2C bus voltage</strong></td>
<td>3.3 V / 5 V</td>
</tr>
<tr>
<td><strong>Operating temperature</strong></td>
<td>-10°C to 70°C</td>
</tr>
<tr>
<td><strong>Mass</strong></td>
<td>115 g</td>
</tr>
<tr>
<td><strong>Dimensions</strong></td>
<td>90 x 96 x 30 mm</td>
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</table>

*The wheel has a turn-on threshold of 7.4 V and a turn-off threshold of 6.4 V.

**Depends on configuration options**

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