# iADCS200

**BST**
Berlin Space Technologies

## Attitude Determination and Control System

The iADCS200 is a fully autonomous integrated ADCS system aimed at small satellites with a 3U-CubeSat form factor or similar.

It is a joint development of Hyperion Technologies B.V. and Berlin Space Technologies GmbH. The iADCS200 is based on the ST200 star tracker, complemented with RW210 series reaction wheels, and MTQ200 series magnetorquers.

The iADCS200 features an internal fire-and-forget controller, which frees up the host processor's workload, providing nadir, sun and target-pointing modes, as well as backup detumbling and intentional spin modes.

The iADCS200 is delivered with a PC104-compatible footprint, consuming the space of 2 standard CubeSat PCB's, or a total of 0.3 U. The CubeSat connector is fed through, allowing designers to place this system anywhere in the CubeSat stack.

**Flight heritage since 2017**

### HIGHLIGHTS

- Fully autonomous, highly integrated attitude determination and control system, including built-in ST200 Star Tracker, 3 orthogonal RW210-series reaction wheels, MTQ200-series magnetorquers and built-in IMU

- Total momentum storage per axis: +/-1.5 up to +/- 6.0 mN.m.s. One reaction wheel per axis
- Maximum torque: 0.1 mN.m
- Three-axis magnetorquer configuration with up to 0.4 A.m² of magnetic dipole moment
- External interface for 6 or more sun sensors
- Fire-and-forget control
- Standard I 2C-compatible interface. RS422, RS485 and UART are optional
- Plug-and-play ready design
- Primary components passed radiation tolerance testing up to 45 krad
- Built in pointing modes:
  Target pointing, sun pointing, nadir pointing, fast spin mode (max 200° using magnetorquers) and de-tumbling
- Low mass: 400g
  (with RW210.15 reaction wheels)
- Low power (nominal): 1.4W
- Outer dimensions: 95 x 90 x 32mm

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## SPECIFICATIONS

### Performance

| Performance | | |
|---|---|---|
| Total momentum storage per axis | +/- 1.5, +/- 3.0, +/- 6.0[1] | mN.m.s |
| Maximum torque | > 0.087 | mN.m |
| Nominal magnetic moment | 0.2 (X, Y), 0.1 (Z) | A.m$^2$ |
| Attitude determination accuracy | 30 | arcseconds (3σ) |
| Pointing accuracy | < <1 | ° |
| Slew rate | > 1.5[2] | °/s |
| Radiation tolerance | > 45[9] | krad (Si) |
| Operating temperature | - 45 / - 20 to + 40 / + 85[7] | °C |
| | | |

### Dimensions

| Dimensions | | |
|---|---|---|
| Outer dimensions | 95 x 90 x 32 | mm |
| Mass | 400 / 435 / 470 | g |
| | | |

### Electrical specifications

| Electrical specifications | Min. | Typ. | Max. | |
|---|---|---|---|---|
| Supply voltage | 4.0 | 5.0[3] | 15[4] | V |
| Bus logic level voltage | | Referenced to Vsys[5] | | V |
| Power consumption | | | | |
| Idle | - | 1150 | - | mW |
| Nominal[7] | - | 1400 | - | mW |
| Peak [8] | - | 4000 | 4500[6] | mW |

[1] Depending on the reaction wheel models
[2] For a 3U CubeSat with the RW210.15 reaction wheel complement, over all axes
[3] When using the 5V system power pins on the standard CubeSat header
[4] When using the VBAT pin on the standard CubeSat header
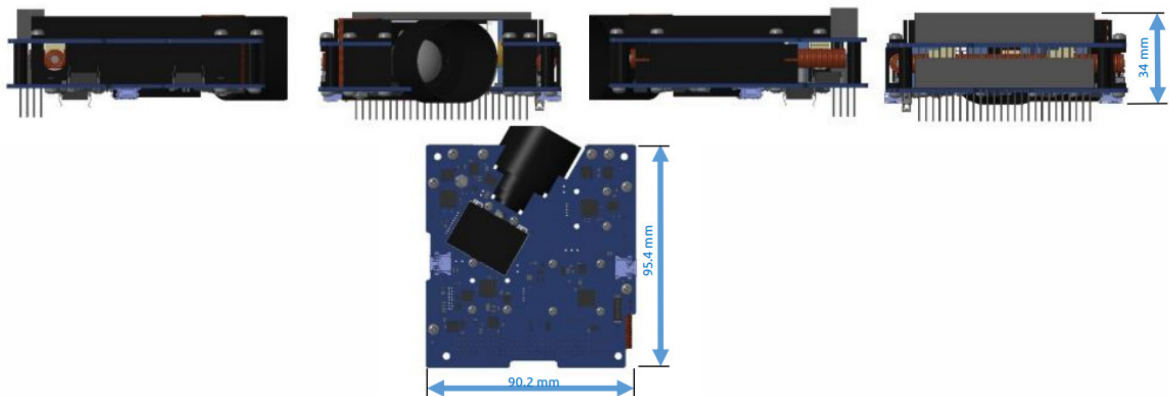[5] Vsys can range from 3.3 to 5.1V for I²C applications.
[6] To be confirmed
[7] Depends on use case
[8] Peak values are given to size the power supply. Power consumption can be limited by the iADCS to match supply
[9] Not accounting for Star Trackers and Reaction Wheels used

## MECHANICAL CHARACTERISTICS (IN MM)



For pricing, delivery, configuration and ordering information please contact us
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