

## Smart Heaters

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Electrically heated temperature control is a widely used concept in spacecraft thermal control. Currently this technology has two main limitations: the use of many cables when using a large number of heaters, and limitations when reconfiguring the temperature setpoints in-flight. The “Smart Heaters” is an autonomous and self-standing electronic control system that can overcome the limitations of traditional temperature control systems. The main objectives of the “*Smart Heaters*” system are therefore: autonomous control of the temperature, in-flight power and temperature reconfigurability via telecommand and reducing the system complexity minimizing its harnessing.

In this project, flexible solutions have been sought to adapt the system to missions with different requirements (i.e., Deep space mission or New Space constellations), as well as to different spacecraft sizes (i.e. Cube sats or satellites). For this reason, a modular design based on a microcontroller with sensors, power control electronics and heaters has been developed. Using this design, multiple heaters will be independently controlled, maintaining temperature setpoint configured via telecommand. In turn, a function to control each heater maximum delivered power will be enabled, being reconfigurable in-flight via telecommand.