Even More Cooling: Iris' New CCE Offerings

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The demand for greater cooling power in space imaging systems is burgeoning, encompassing both earth-observing and space-observing missions. To meet this demand, there is an escalating need for larger cryocoolers and the integration of multiple cryocoolers onto the same mission. Iris Technology is at the forefront of addressing these demands by developing advanced cryocooler control electronics (CCE) capable of providing substantially higher power output and the integration of multiple CCEs into a single enclosure.

Iris' forthcoming higher-power CCE will offer an impressive electrical power output of up to 1000 watts, catering to space cryocoolers with power demands surpassing 200 watts. That's 5x great output than the current Iris CCEs.

Moreover, Iris Technology is pioneering the development of "hybrid" electronic units that amalgamate multiple functions within a single enclosure. This consolidation not only reduces volume and mass but also obviates the necessity for additional enclosures. Further reductions in Size, Weight, and Power (SWaP) may be achieved through the identification of circuit commonalities.

To date, Iris Technology has successfully devised two hybrid designs. One integrates two sets of CCEs within a single enclosure, while the other adds a heater controller function to a CCE.

In this presentation, Iris Technology will delve into the architectural framework of the higher-power CCE, elucidating potential use cases, outlining encountered challenges, and presenting test findings. These findings will encompass power stability, efficiency, control mechanisms, current in-rush demand, and input current ripple.

Additionally, Iris Technology will discuss the two hybrid systems developed thus far and contemplate potential applications for other systems leveraging Iris' space electronics functionalities. This presentation aims to underscore Iris Technology's commitment to advancing cryocooler control electronics, thereby fostering innovation and efficiency in space imaging systems.