

## REDWIRE & UEI • ESA's Thermal Science Mission

### WORKING TOGETHER TO BUILD THE FUTURE OF SPACE TEST SYSTEMS

Redwire, a global leader in space and defense technology company, designed and developed the Heat Transfer Host 2 (HTH-2) facility for the European Space Agency (ESA). HTH-2 was launched to the International Space Station (ISS) aboard the NG-23 Cygnus mission in September 2025.

To meet the demanding requirements of HTH-2, Redwire integrated UEI's rugged embedded computing hardware to deliver reliable data acquisition, remote control, and modular diagnostics support in orbit.

### THE IMMEDIATE CHALLENGES

- 1 **Reliable Data Acquisition in Microgravity:** Capturing high-resolution thermal and optical data synchronized with the data acquisition channels.
- 2 **Remote Experiment Control:** Enabling ground-based teams to operate and monitor experiments aboard the ISS with precision and minimal latency.
- 3 **Modular Integration of Diverse Diagnostics:** Supporting infrared cameras, optical interferometry, and Fourier-based deflectometry within a unified control and data framework.
- 4 **Repeatable Experiment Protocols:** Facilitating multiple runs of each experiment with consistent environmental conditions and system stability.
- 5 **On-Orbit Hardware Reliability:** Deploying rugged, space-rated systems that operate autonomously in the ISS environment over extended periods.

### PATHWAYS TO SUCCESS

Redwire selected UEI's 7-slot programmable automation controller (UEIPAC) system to serve as the embedded control and data acquisition backbone for HTH-2. The UEIPAC's modular design and robust I/O capabilities enabled seamless integration with the facility's advanced diagnostics and control systems.



Redwire - Heat Transfer Host 2 facility



UEI's 7-Slot UEIPAC CUBE I/O

- ✓ **High-performance DAQ:** UEI hardware synchronized real-time data from infrared and optical sensors, supporting detailed analysis of heat transfer phenomena.
- ✓ **Remote Automation:** UEI's real-time control capabilities allowed ground teams to initiate, monitor, and repeat experiments with minimal intervention.
- ✓ **Flexible Integration:** The UEIPAC interfaced with diverse sensor arrays and control modules, supporting modular inserts tailored to specific experiments.
- ✓ **Mission Reliability:** UEI's proven durability in harsh environments ensured uninterrupted operation throughout the mission lifecycle.

# END RESULT

*"I'M HAPPY TO REPORT THE UEIPAC, ALONG WITH THE OTHER ELEMENTS OF THE PAYLOAD, ARE WORKING WELL AND PRODUCING SCIENCE DATA IN THE EUROPEAN SEGMENT OF THE ISS! THANK YOU FOR YOUR FINE PRODUCT AND SUPPORT."*

—ERIK LEUSSINK | SENIOR SOFTWARE ARCHITECT

## GREAT PARTNERSHIP. OUTSTANDING SOLUTIONS.

**UEI's embedded systems gave Redwire the flexibility and reliability needed to support ESA's HTH-2 experiments in orbit. UEI hardware was instrumental in enabling repeatable, high-fidelity data acquisition and control.**

- [WIN]** ESA's Heat Transfer Host 2 facility is now a cornerstone of space-based thermal science, enabling researchers to study condensation, evaporation, and fluid dynamics in microgravity with unprecedented clarity.
- [WIN]** With UEI's UEIPAC at the heart of the system and Redwire's mission integration expertise, HTH-2 continues to deliver critical insights that will shape future spacecraft design and deep space exploration.
- [WIN]** UEI's engineering support and versatile hardware platform have empowered Redwire to deliver a dynamic, reliable research environment that meets the demands of modern space science.

**ASK US HOW UEI CAN DO THE SAME FOR YOUR COMPANY!**



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