

## United Electronic Industries & NASA SAFFIRE

### WHAT IS THE NASA SAFFIRE PROGRAM?

The NASA SAFFIRE program was created in 2016 in order to observe the behaviors and characteristics of fire in space. Its initial objective included three carefully controlled experiments, SAFFIRE-I, -II, and -III, each of which was performed on a Cygnus cargo vehicle after it had completed its International Space Station resupply mission.

### CHALLENGES OF SAFFIRE DATA ACQUISITION

SAFFIRE was designed to study large flame growth and material flammability limits in microgravity, which will be essential to the design and construction of future spacecraft and the development of informed protocols for dealing with fire emergencies in space. In order to acquire key data, NASA needed compact and rugged data acquisition hardware and I/O that could handle the rigors of an extreme environment. Finding the right solution that allowed engineers to capture data in space efficiently and without failure was a must.



### UEI'S PATHWAY TO SUCCESS FOR NASA SAFFIRE

- The SAFFIRE missions could only be a success if the DAQ system could withstand a rocket launch, work in a space environment, and have the flexibility to work with any I/O and sensors — UEI checked all these boxes.
- To ensure success, each of the SAFFIRE modules was equipped with a 6-Slot PowerDNA Cube data acquisition and control system that could accurately read data and send control signals to a variety of sensors, such as thermocouples, oxygen and carbon dioxide meters, a pressure transducer, a calibrated radiometer, and two HD video cameras.
- The PowerDNA Cube recorded a wide range of diagnostic data over the course of each SAFFIRE experiment, including temperature, pressure, airflow, broadband radiative emissions, oxidizer flux, and pyrolysis length.
- Once the experiment concluded, the PowerDNA Cube downlinked the data to ground stations around the globe.

## END RESULT UEI HARDWARE ENSURED THE SUCCESS OF THE SAFFIRE MISSIONS BY GUARANTEEING RELIABLE AND ACCURATE DATA COLLECTION.

- [WIN]** The UEI PowerDNA Cube provided a centralized data acquisition and control system that was easy to operate but flexible and sophisticated enough to communicate with a variety of sensors.
- [WIN]** With the results of the SAFFIRE experiments, NASA gained a much more robust understanding of how fire behaves in microgravity and how different materials propagate flame.
- [WIN]** The data UEI's PowerDNA Cube collected will allow engineers to confidently develop operational protocols that will guarantee crew safety during fire emergencies on future spacecraft.

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

