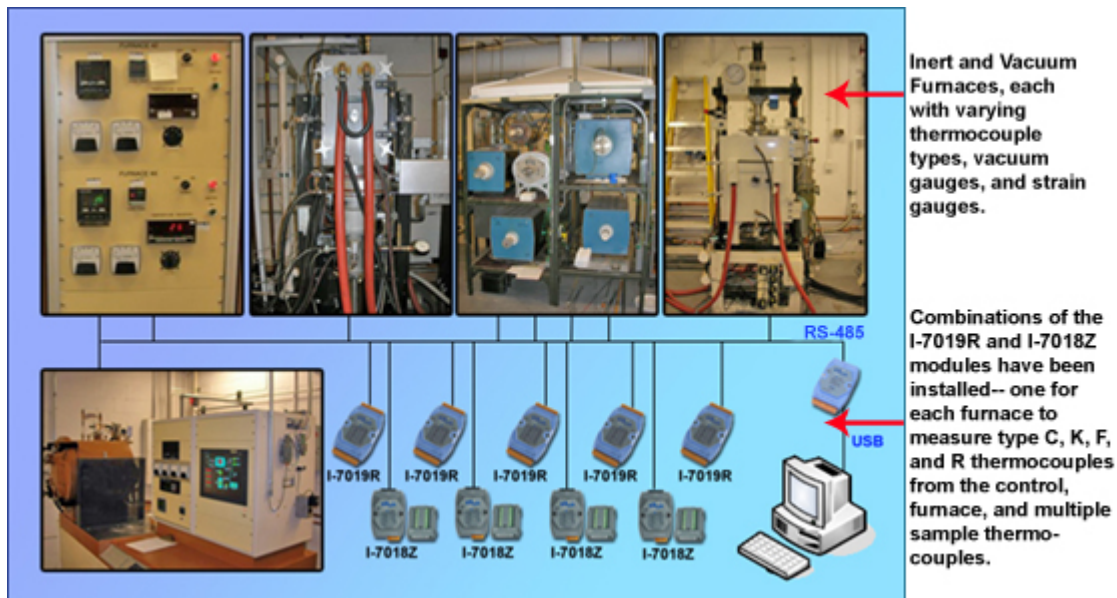




Embedded Control and Data Acquisition



NASA Inert and Vacuum Furnace Application

ICP DAS USA recently had the opportunity to help NASA, the National Aeronautics and Space Administration with a very exciting application. Some NASA researchers were developing high temperature materials for both the aeronautics industry and for deep space flight. Accurate measurement and repeatability of their experiments was critical in fulfilling their mission. They chose modules from the [ICP DAS I-7000 series](#) for this application.

Before they learned of ICP DAS modules, researchers in their group used varying brands of D/A modules and software from different vendors, as well as manual readings to log data from their research projects. The need was evident for a new standardized system that could be implemented throughout their labs in order to save researcher's time and to reduce costs. The challenge was to design a flexible and reliable data acquisition network that any researcher could customize, expand, and operate with minimal experience.

Two of the major labs that they have implemented ICP DAS modules in are the Heat Treatment Facility and the Creep Testing Lab. These facilities consist of a number of different inert and vacuum furnaces, each with varying thermocouple types, vacuum gauges, and strain gauges.

An existing D/A software package developed by NASA was modified to use the DCON protocol to communicate with the [I-7000 series](#). Combinations of the [I-7019R](#) and [I-7018Z](#) modules have been installed -- one for each furnace to measure type C, K, F, and R thermocouples from the control, furnace, and multiple sample thermocouples. The ability to easily log channels of different types from a single ICP module along with the durability and ruggedness of these modules was important in their decision. These factors have led to the standardization of the [ICP DAS I-7000 series](#) being implemented into other NASA labs.



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Distinguishing characteristics of the ICP DAS I-7000 series

1. Ability to independently read different types of channels from a single module.
2. Ability for a module to read TC, mV, 2.5V or 10V, and mA signals.
3. Capable of reading Type C thermocouples.
4. 4. Ease of Expansion - New modules can simply be added to an existing 485 D/A network with a simple twisted pair.