

# Addressing Power Challenges In High-Altitude Applications

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**As electronic systems migrate deeper into systems that may present changing situations during the operating lifecycle, the designer must remember to address every facet or risk compromising product performance in certain situations.**

Not every thermal challenge involves hot or wet environments, as we recently found out when [GlobTek](#) [1] provided a power supply solution to serve an RFID application. In this case the manufacturer was concerned with high-altitude issues related to the shipping industry and airfreight. Many do not realize that the interior of an airplane, while pressurized, actually has an equivalent effective cabin altitude of around 7,000 feet (~2100 meters).

The challenges electronics face at altitude range from capacitor damage to soft error, but these issues are normally reserved for avionics designers. However, there are many kinds of electronics operating in aircraft that were never designed with the aircraft as its primary environment. Tablets, laptops, and music players are all routinely used in situations where the air pressure may not have been taken into consideration. As consumer devices, problems with operation at altitude are a nuisance, but with commercial electronics operating issues can damage the business.

RFID technology has empowered logistics tremendously, and the benefits of intelligent package tracking have revolutionized how supply chains are managed. It is the very ubiquitous nature of RFID systems that creates environmental operating issues such as dealing with low-pressure environments encountered during air transport. In this case the concern was thermal management in the power supply we provided.

The important aspect in this situation was the power supply's thermal management in the thinner air of an aircraft cargo hold. Less-dense air also has a lowered ability to capture and move heat, challenging cooling systems designed for sea-level air densities and thermal characteristics. GlobTek addressed the customer's need by ensuring that the cooling system in the power supply was able to function at altitudes as high as 9500 feet (2950 meters). The power supplies were altitude-tested to ensure they met the customer's requirements.

In addition to its altitude performance, the GlobTek GT-41083-4024-T2 power supply accepts a universal input and is available in versions delivering an output (for this application) of 24 VDC. Additional features included an output load regulation of  $\pm 5$  percent, an output ripple of  $\pm 1$  percent, and overvoltage and short-circuit protection. Beyond thermal compensation for altitude, other changes needed

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to be made to serve the application.

The important thing to remember is that challenging environments are often present in situations and applications you may not have expected. As electronic systems migrate deeper into systems that may present changing situations during the operating lifecycle, the designer must remember to address every facet or risk compromising product performance in certain situations.

*For more information visit [www.globtek.com](http://www.globtek.com) [2].*

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