WHITE PAPER

RADIOS IN OUTDOOR ENVIRONMENT

HOW MUCH PROTECTION DO YOU NEED?

INTRODUCTION

To minimize the RF power loss, It is often desirable to place wireless equipment outdoors, close to the antenna. close to the antenna. Such needs become especially acute for base stations, which need to establish line-of-sight to a number of client units. and thus need to be located as high as possible. Sometimes, towers of a few hundred feet are erected just for this purpose. Many vendors have indeed taken the main radio unit outside to minimize the RF power loss and to extend coverage areas.

The outdoor environment, however, is not very kind to electronics. In fact, with the internal radio circuits operating at microwave frequencies (2 – 6 GHz), wireless devices are very susceptible to moisture, water droplets, and temperature changes. The symptoms could include degraded performance and downright equipment failure. Unfortunately, such a failure may not manifest itself at the time of deployment. Rather, it could happen over the course of field operation gradually, leading to the unexpected downtime and difficult diagnostics.

Rather than forcing a product designed for indoors into outdoor service (especially 802.11b access points), the design of Solectek's outdoor equipment has taken these environmental difficulties into consideration from the earliest stages of design.

The following steps taken insure that the SkyWay product is totally weatherproof for long-term reliability. SkyWay is **specifically approved by UL for outdoor uses**.

Heavy snowfall, driving rain storm, freezing and boiling temperatures:

these are the weather elements your outdoor radios must endure for long-term stable operation

Industrial Grade Components

Most electronics boards are assembled with "commercial" grade parts, resulting in products suitable only for ambient temperatures of 0 to 40C and unsuitable for outdoor applications. Many wireless vendors are opting to use commercial parts even in products destined for outdoor applications. Solectek SkyWay products use only industrial grade parts that are rated for extended temperature ranges. All parts inside are rated for the minimum range of –30C to 70C each.

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Military Spec Connectors

Designers of high frequency products must worry about all possible ways for moisture to enter the enclosure. In particular, the connector areas are often susceptible to moisture penetration.. To make it worse, it is difficult to diagnose since the "water-in-connector" problems are often overlooked and only possible to see when units are physically inspected - costing labor and prolonged downed time for the operator. Solectek uses water tight, military spec connectors for all cable connections. The connectors provide a secure, watertight snap fit with the cable and make it easy to connect in the field and under extreme weather conditions.

Watertight Chassis

Our NEMA 4X chassis is protected with gaskets that provide water tightness. Solectek testing of the outdoor chassis includes 24 hour under-water tests with no water intrusion

Temperature Stability

Solectek products have built-in Automatic Level Control (ALC) and Automatic Gain Control (AGC) systems. Together, these two systems maintain consistent radio performance regardless of changes in weather, data traffic or long-term aging of the circuit elements.

MTBF

The MTBF (Mean Time Before Failure) was calculated using the industry standard BellCore Method, taking all parts into consideration. The SkyWay MTBF exceeds 50,000 hours in extreme temperatures (-30C and 70C). At 20C, the MTBF is close to 100,000 hours, more than 10 years of operation.

Summary

In summary, the Solectek Skyway product family has been designed to withstand the toughest conditions that Nature can deliver. And with thousands of outdoor units reliably operating today, we have demonstrated that our design for outdoor equipment gives the customer the ultimate reliability.

Solectek Corporation, headquartered in San Diego, California, designs, manufactures and markets a full line of wireless interconnectivity products. Through technical innovation and steady revenue growth, Solectek has become a recognized leader in the wireless LAN/WAN connectivity market and the industry market leader in wireless bridges. Founded in 1989, Solectek has over 15,000 installations worldwide. The Solectek product line of wireless bridges and routers is the most flexible, reliable and secure in the industry. For more information visit www.solectek.com.

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