



Engineers at Geolux have developed the first radar-based snow depth sensor, providing an accurate, compact and low-power solution for various sectors including transportation, agriculture and renewable energy.

Snow depth measurement holds much importance in meteorological and hydrological observations, affecting critical sectors such as transportation, agriculture and renewable energy, among others. The methods traditionally employed for snow depth measurement have mainly revolved around in situ manual measurement or the use of remote sensing technologies such as ultrasound and lasers. However, these methods come with constraints. Ultrasound accuracy can be compromised by temperature gradients, and laser technology is expensive. Furthermore, both methods tend to have degraded performance under precipitation and fogging conditions, which are common when dealing with snow. Geolux's groundbreaking LX-80S addresses these challenges. This sensor uses radar technology to measure the distance between the device and the snow surface, similar to how water level radar sensors operate. However, the difference in density and structure of snow results in weaker radar signal reflections from snow than from a water surface. Overcoming these challenges, Geolux engineers have introduced the first radar-based snow depth sensor to the market.



In any condition

The benefits of using radar technology for non-contact snow depth measurement lies in the fact that the radar sensor will report the measurement regardless of the weather. Fog, air temperature gradient and precipitation do not affect radar measurements. Additionally, the 5° beam width ensures precise focus while minimizing errors influenced by nearby structures or wildlife. With its compact size, installation becomes simplified, eliminating the need for complex support structures. Applications for the LX-80S span various sectors. In transportation, for example, understanding the snow depth near roads and railways is pivotal for maintenance and safety protocols. The LX-80S delivers real-time data to guide snow removal efforts and travel advisories. In smart cities, meanwhile, the data provided by LX-80S streamlines snow removal management. The impact of snow accumulation on solar power plants can be detrimental. The weight of snow can damage solar panels, leading to costly repairs and reduced efficiency. Employing the LX-80S enables active monitoring of snow build-up, facilitating timely actions to maintain energy production. Agriculture relies on accurate snow depth data to predict post-thaw crop hydration and prepare for potential flooding. The information provided by the LX-80S aids farmers in planning their operations, thereby contributing to food security.

Climatic shifts

Climate change is an urgent global challenge, and monitoring snow depth holds great importance in understanding its implications. Changes in snow depth patterns offer critical insights into broader climatic alterations. In regions reliant on snowmelt for freshwater resources, shifts in snow depth and timing can affect ecosystems, water availability and various economic sectors. Additionally, alterations in snow cover influence albedo – the reflection of sunlight – thereby affecting regional climate and, in some instances, accelerating warming trends. Monitoring these changes and comprehending the relationship between snow depth and climate is vital in advancing our understanding of environmental shifts and their consequences. The Geolux LX-80S has been designed and engineered



with all these applications in mind. It also implements several industry-standard communication interfaces to enable simple and quick connection to various dataloggers, PLCs and modems. The LX-80S supports the Modbus and SDI-12 protocols, as well as proprietary data protocols over an RS-232 serial link. Analog 4-20mA output is also supported. The instrument is designed for low power consumption. It consumes less than 2W while operating and can enter sleep mode between measurements, when power consumption is less than 0.05W. The LX-80S, with its ability to measure snow depth consistently and accurately, emerges as a crucial tool in observing changes. Its precise and reliable data collection under diverse weather conditions provides researchers with invaluable insights into alterations in snow depth patterns and their relationship to broader climatic shifts, contributing greatly to our understanding of climate change. The LX-80S not only aids in real-time decision making, but also plays a pivotal role in monitoring and comprehending the ramifications of climate change on snow depth, thereby advancing our knowledge of these critical environmental changes.