WIRELESS MAXIMIZES SKI EXPERIENCE

Plenty of snow, open slopes and good preparation are increasingly important for today's skiing experience. To be able to guarantee snow is becoming an increasingly important issue when ski tourists choose destinations, and typically they choose destinations based on previous years' snow conditions. Simply relying on the weather is not enough in today's competitive tourist market. The amount of snow produced by machines is increasing every year in order to guarantee a good skiing experience.

In many respects, machine-made snow is by far better than natural snow. Machine-made snow can withstand wear from skiers better and it degrades less over time compared to natural snow. It simply offers better quality over time. In addition, it withstands heat a little better than natural snow. By automating the production of snow, up to 30% more snow can be produced compared to manual snowmaking, and this also results in reduced environmental stress.

Lenko Snow is the Swedish company that pioneered the fully automatic snow production industry, and it currently supplies snow systems worldwide. The process is fully automatic and it can in many ways be compared to an industrial automation process. The snow machines could in principle be controlled with a standard PLC, but Lenko Snow has chosen to develop its own hardware and its own control system, because environmental requirements are difficult to meet with standard products. Lenko Snow's current automation system specification is reminiscent of a military standard, with tough specifications for mechanical strength as well as environmentally high standards.

AN EYE ON THE WEATHER

Lenko Snow has developed software called SNOWNet, with which it is possible to monitor and control snow production from an operational monitoring computer. Communication between snow machines, weather stations, pumping stations and the control central computer is often done wirelessly via radio modems from SATEL. Using the data collected from weather stations, the system optimizes snow production. SNOWNet manages the entire operation of the network; the staff need not be at the computer, but can access the system at any time via the internet or SMS.

The very principle of converting water into snow is about maximizing hang time in the air, i.e. to maximize the water drops' time in the air. These conditions are constantly changing with changes in the weather, temperature and wind direction. The fully automated system is a continuous study of weather parameters like wind direction, air pressure and temperature. The process computer with the SNOWNet program starts and stops the snow machines and regulates the amount of water and air, providing optimized snowmaking and maximizing the amount of snow being produced at each single moment. When the weather conditions are right, the snow machines start to produce snow. During snow production, the system monitors and regulates a range of operating parameters such as the amounts of air and water. Continuously during the operation, the parameters are adjusted based on the prevailing weather conditions at the gun location.

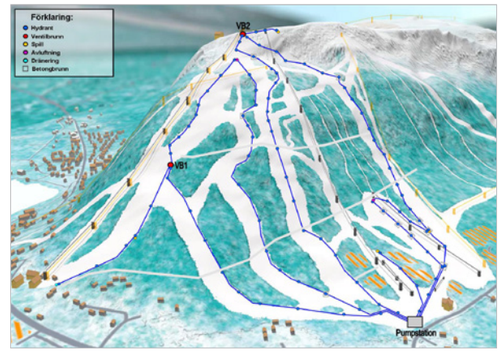
The stations are connected by radio

Lenko Snow has used the SATELLINE radio modem from SATEL in its solution for almost 20 years. SATEL radio modems are used in many of the plants Lenko Snow delivers. Radio modems give the user the flexibility to place their snow guns anywhere on the slopes. End users have high demands on their communications solution; the equipment must operate properly throughout the season, otherwise the operators of the hill will incur a financial loss. The radio modems used in the solution must work well under tough conditions; daily life on the slopes is a combination of large doses of cold, humidity and vibration.

An example from the real world

Funäsdalen is an example of a system that Lenko Snow delivered in Sweden. It is a fully automated system located in Funäsdalen. In total, 22 snow machines produce snow on the slopes with a total length of 10 km. Water is taken from the nearby Ljusnan river and is then distributed via a system of pumping stations, tubing and valves to 99 water distribution points throughout the system. A snow machine can be connected to any of these points. The process computer with SNOWNet communicates wirelessly via radio modems with the snow machines, pumps and valves. The pumping station is the system's heart and it is connected to the system's brain, the SNOWNet computer, by radio modems. The brain gathers weather data from the weather stations and sends commands to the right valves to open when needed, and instructs the pumps to supply the right amount of water. The result is that the snow machines receive the correct parameters to produce optimal snow.

Photos: Lenko Snow



Technical facts:

Snow machine

To produce snow with a snow machine requires interaction between water, air and electricity. The snow machine's principle is to blow air through a drum with strong fans. To the air stream, water is added. The water is atomized through nozzles and added under high pressure into the air stream.

Weather Station

The weather station collects weather data such as humidity, air pressure and wind direction for the snowmaking system. However, temperature is measured at each snowmaking device as well to give a precise value. The weather station has no moving parts. The integrated, weatherproof antenna and all the parts are fitted in a housing insulated with double walls to withstand the enormous environmental strain that exists where these units are installed. The housing also protects the electronics from extreme temperatures.