Currently available snow pack monitoring methods are limited due to spatial resolution or to adequate weather and secure avalanche conditions. Snow pack monitoring is impossible if the method is destructive as snow probing and thereby the use for avalanche forecasts limited. Ultrasonic snow height sensors are not feasible for an application in snow deposition areas along ridges or in avalanche paths. For the validation and improvement of snow pack simulation models, it is of high importance to measure snow pack conditions with a high spatial resolution in real-time. We have developed a measuring concept for the application of Ground Penetrating Radar (GPR) -systems from below the snow pack. With a vertically moving GPR-antenna it is possible to record reflections, which can be related to snow height and internal layering with adequate density steps and layer thickness. Field data sets from three winters in the Austrian Alps resulted in an average value for the velocity of propagation of pulsed radar waves in dry snow with a coefficient of variation (CV) of about 6 %. Additionally we conducted some preliminary measurements in a wet spring snow pack to analyze the feasibility of the system. In contrast to Frequency Modulated Continuous Waves (FMCW) radar, the snow-air-interface was detectable and thereby the snow height could be estimated. The applied sensor system is able to determine snow height, snow accumulation and erosion rates in combination with a known electrical permittivity value of dry snow. In combination with nearby traditional snow height measurement systems, the snow water equivalent can be derived very accurately and with high temporal resolution.