remote sensor network

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High-throughput (HT) plant phenotyping systems enable the quantitative analysis of a variety of plant features in a fully automated fashion. The comprehensive phenomics infrastructure at IPK comprises three LemnaTec conveyor belt-based (plant-to-sensor) systems for the simultaneous analysis of large numbers of individual plants of different sizes. For monitoring of environmental conditions within the plant growth area and soil conditions in individual pots, highly modular and flexible remote sensing devices are required. We present the architecture of a wireless sensor network implemented in the HT plant phenotyping systems at IPK in the frame of the German Plant Phenotyping Network (DPPN). This system comprises 350 soil monitoring modules, each measuring water content, water matrix potential, temperature and electric conductivity. Furthermore small and large sensor platforms enable the continuous monitoring of environmental parameters such as incident photosynthetic active radiation, total radiation balance, relative humidity and CO_2 concentration and more. Finally we present an introduction into data management and maintenance."