



Technology Transfer in Computing Systems

D3.41: Individual TTP41 abstract

Project no.: 609491
Funding scheme: Collaborative project
Start date of the project: 1st September 2013
Duration: 36 months
Work programme topic: FP7-ICT-2013-10

Deliverable type: Report
Deliverable reference number: ICT-609491 / D3.41
WP and tasks contributing: WP 3 / all
Due date: 30/06/2016
Actual submission date: 27/06/2016

Responsible Organization: USalento
Dissemination Level: Public
Revision: 1.0



TETRACOM D3.41: SMART_APP - Systems and Monitoring Apparata based on Reflectometric Techniques for Agricultural aPPlications

Andrea Cataldo, Antonio Masciullo (University of Salento), Cosimo Capodiecì, Erminio Efisio Riezzo (Sysman Progetti & Servizi S.R.L.)

As pointed out in a recent Study commissioned by the European Union, agriculture accounts for around a third of total water use in Europe (reaching 80% in certain parts of Southern Europe). While enhancing the yield of the cultivations, irrigation can and does lead to a range of negative environmental impacts, including water scarcity. Improving irrigation, for example by switching from furrows to drip systems, has increased water efficiency but has not always reduced the total amount of water abstracted (for example, in parts of Spain efficiency gains led to a tripling of irrigated area). In this regard, the aforementioned Study also suggests that one of the strategies for improving water resource efficiency in agriculture, thus leading to significant water saving, is to improve the timing of irrigation so that it closely follows the water requirements of the cultivations. In such a context, the present TTP provides a new technological tool for improving the efficiency and sustainability of agricultural water use. More specifically, the TTP focuses on the implementation of an innovative system for the diffused, real-time monitoring of the soil water content in agricultural cultivations.

Currently, to monitor large areas and to obtain the diffused moisture content profile, it is necessary to disseminate a high number of point-sensors, with consequent drawbacks regarding interrogation, spatial resolution, calibration and maintenance (e.g. for replacing batteries). Instead, the TTP technology employs diffused sensors and an electromagnetic measurement technique (namely, time domain reflectometry, TDR). Therefore, differently from most of the available commercial solutions for measuring water content (which have a very limited sensing volume and poor information capacity), the technology considered in the TTP allows to implement a tailored automatic intervention, which is crucial for the optimal management of hydric resources and irrigation processes. The resulting sensors network can “communicate” with the irrigation systems; in this way, it would be possible to automatically control (also remotely) the irrigators and to activate/deactivate the electro valves, according to the actual water conditions/requirements of the specific cultivations. Thanks to these features, the technology of this TTP is expected to foster a proactive management of water resources in agriculture, by favoring the economical sustainability of the agricultural field, in terms of optimization/reduction of the exploitation of water resources.

The Company Partner involved in the TTP, Sysman Progetti & Servizi s.r.l., is a pioneer in the design and implementation of smart solutions and decision-support systems in agriculture. They have recently developed innovative tools for Decision Support System (DSS) for agriculture (BLUELEAF): their systems collect data from different sensors and provide the user with the information on the environmental and climatic conditions and also on the cultivation, so as to monitor the evolution of the cultivation and assist the operator managing the cultivation. In this regard, the TTP has given the Company partner the opportunity to further enhance the features of BLUELEAF: the new sensor for diffused soil water content monitoring will help to improve and ensure optimal management of water resources and irrigation processes, by “feeding” real data acquired from low-cost, on-the-field sensors that could monitor large cultivation areas.

The know-how transfer of the TTP has included both of frontal teaching in training course and in-the-field activities. The Company Partner have had the opportunity to assess the suitability of the proposed technology in realistic agricultural applications and to verify the possibility of integration with BLUELEAF. The results of this TTP have paved the way for the successive step, which will consist to the full integration of the TTP technology with the BLUELEAF, thus further innovating this technology and extending its potential for agricultural cultivation management.