

# Smart energy and water meter: a unique vision to groundwater monitoring and management

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## Abstract

Groundwater is a life-sustaining resource that supplies water to billions of people, plays a central part in irrigated agriculture and influences the health of many ecosystems.

Limitation of water resources has always been a concern during recent decades. This apprehension has increasingly been deteriorating in the regions where people solely rely on groundwater resources. Indiscriminate use of these priceless resources leads to some inevitable consequences such as decline in groundwater tables which is irreparable in short run. In the meantime, water pumping requires loads of energy; therefore, another issue is increasing energy demand for running electro-pumps of water wells. The later one results in peak hours of energy consumption, subsequently, the need for controlling it arises.

Optimum utilization of these resources will be possible through monitoring and controlling the incoming and outgoing amounts of water. Thus, water specialists have been prompted to manage and control water extraction in order to prevent the possible treat of water crisis. In line with this issue, RSA Electronics offers an exclusive and practical solution for monitoring and management of groundwater resources in an accurate and reliable way. This solution for information management includes three main elements: Metering Device, Communication Device and Software in which communication device enjoys both online and offline. In the first mode, the specific Information of water wells which are calculated by the metering device through a patented method will be transferred to the control centre via telecommunication infrastructures; subsequently in control centre, data gathering, information processing and reporting is performed by Meter Data Management (MDM) software, while in the second one information are directly transferred to HHU and then will be analyzed in the same way. Credit and other settings could be transferred to the metering device from control centre via smart card, modem or Hand-Held-Unit (which is applicable by patrol-and-audit teams).

The meter which was patented in USA (Patent No.: US 7,734,441 B2) measures water consumption volume by measuring the amount of energy consumption via electro-pump of water wells. Smart energy and water meter (SEWM) is a combination of three following devices: a Digital Energy Meter, a Digital Water Meter, a Credit and Control Device. Mentioned features are quite unique and only achievable by combining energy and water meter in a single package. It is obvious that no similar device can provide these capabilities which enable water and energy utility companies for fining infringing farmers, savings in energy subsidies and controlling groundwater resources. This project has been successfully done and 40000 meters has been installed so far.

In conclusion, the smart energy and water meter (SEWM) can meet the policy of monitoring energy/water consumption by control on the volume of water and the amount of energy simultaneously in a single package.