Products and solutions for irrigation

Enhanced plant performance, efficiency and reliability
About 70 percent of the freshwater that the world consumes is used for irrigation. This isn’t surprising since a single kilogram of rice requires from 1,000 to 6,000 liters of water, depending on the cultivation technique. A rational use of this precious resource is of utmost importance. ABB helps manage water resources in agricultural applications with integrated solutions that control the entire process from district plant to individual farm hydrant.

ABB’s experience in irrigation projects and our specific solutions for controlling irrigation help customers to maximize energy efficiency and to optimize water consumption. We know how to design distributed intelligent solutions for controlling all hydraulic nodes in a coordinated way, delivering water in the right quantity and quality to meet customer requirements.

The ideal partner to meet irrigation needs

ABB software and instrumentation enables complete management of the process – including irrigation programs, water leakage, and energy management – whether from a utility control center or a remote device. Our portfolio includes products and solutions covering the entire electrical and automation scope for irrigation projects: drives and motors, soft-starters, low, medium and high-voltage switchgears and components, transformers, instrumentation, control products and PLCs (programmable logic controllers), DCS (Distributed Control Systems), Network Management solutions, and optimization and asset management tools.
From Products to Turnkey Projects

A leader for integrated solutions

ABB combines in-house technology with process know-how to develop complete integrated solutions. We serve both end users and EPC contractors, delivering turnkey projects, integrated systems, power and automation products.

ABB is the ideal partner for large irrigation schemes and can take on the responsibility for building complete solutions. By serving as a single interface for the project, we reduce costs and increase efficiency.

From water plants to hydrants

ABB integrated solutions are designed to manage the entire irrigation process from primary network control through district supply to individual hydrants. Our portfolio of products and solutions support irrigation management over thousands of hectares, helping customers to increase energy efficiency, water savings, and irrigation efficacy.
An Open Window into the Process

Requirements under control
ABB’s monitoring and automation solutions manage thousands of remote units to control the opening and closing of hydraulic valves, measure flow, and actuate automatic irrigation programs. Irrigation programs can be managed in an easy and flexible way (by time, volume, turn, quota, hectare, climatology criteria, or specific farmer requirements) from any remote device (PC or mobile phones). This flexibility dramatically reduces time and costs and facilitates energy saving (for example, by encouraging irrigation during the night).

The perfect balance of power, performances, flexibility and control
ABB’s complete instrumentation portfolio provides customers with new levels of flexibility, measuring accuracy, and intuitive control for the complete spectrum of flow measurement in water applications. Our instrumentation is easy to install, with smooth connectivity to network management systems and direct access to quick data reports from web and wireless devices.
The control of irrigation networks requires communications over thousands of hectares. That’s why ABB has developed a new generation of Remote Terminal Units (RTU) compatible with all the main communication protocols based on cable, radio, and wireless standards (GPRS, EDGE, UMTS, HSDPA). Each RTU can manage one or more hydrants, guarantees connection to the control center, and allows for automatic management of irrigation programs.

**Wireless management of each hydrant**

ABB’s RTUs are fully stand-alone and have minimum power consumption thanks to the intelligent hardware design and to the “sleeping mode” function. They can use long-life batteries (up to 7 years) or small solar panels for the power supply.

Their rugged and hermetic design allows installation in any conditions, including harsh environments, such as those with extreme temperatures and exposure to humidity.

**Access to data, anytime, anywhere**

ABB’s SCADA systems (Supervisory Control and Data Acquisition) allow real-time access to field information coming from the remote stations. The SCADA systems monitor water and energy consumption and centralize the management of pumping stations, reservoirs, treatment plants, and hydrants.

At the same time, each farmer—using a Web connection or personal mobile device—can open and close the valves of the farm’s individual hydrants, change irrigation programs, and check personal consumption.
Canal de Zujar: 21,000 hectares under control

With 95 km of open channel and 27 m³/s capacity, Canal de Zujar serves 21,141 hectares, 10 sectors, and 10,791 districts in the Badajoz area of southwest Spain. ABB’s integrated solution, based on one control center and 7,934 Remote Terminal Units (RTU), allows the management of all operations related to irrigation, including opening and closing hydraulic valves, reading water and pressure counters, metering water consumption, controlling volumetric or quota irrigation programs, and reporting alarms. All the units are connected via wireless and are powered by solar panels. The system can handle several irrigation programs daily, by demand or by climatology optimization. Operators can see or modify any data or any irrigation program from any place at any moment, directly from a PC or using a wireless connection through mobile devices.

Comunidad de regantes de Lorca: 12,000 hectares under control

With 6 pumping stations, 6 reservoirs and 2 waste water treatment plants the Comunidad de Regantes of Lorca serves 12,000 hectares split in into 6 sectors in Lorca area (Murcia), east of Spain. ABB’s integrated solution is based on one main control center, 6 secondary control centers, 30 concentrators, 2,500 Remote Terminal Units (RTU) based on cable/radio communication technology, 1,200 Remote Terminal Units (RTU) based on GPRS communications. The solution allows the management of the complete irrigation process and is optimized to reduce power consumption and remote access of mobile users.
Kalwakurthy: breakthrough success in India

In the Indian government program for developing the agriculture sector, the improvement of irrigation infrastructures is a key issue.

For example, ABB is helping to set up a lift irrigation scheme called Kalwakurthy Lift Irrigation Project in Andhra Pradesh. The scheme will benefit thousands of farmers around the Krishna River basin region, irrigating nearly 250,000 acres of parched land. ABB’s turnkey solution includes the 220 kV switchyard, power transformers, a SCADA system, large synchronous machines, LCI (Load Commutated Inverter) starting equipment, motor control and relay panels, instrumentation, and controls.

Dummugudum – Nagarjuna Sagar tam irrigation scheme

The Government of Andhra Pradesh, Southern India, has launched an important irrigation project based on the diversion of flood water from River Godavari to Nagarjuna Sagar Dam. The Nagarjuna Sagar Dam is the tallest masonry dam in the world. This colossal dam supplies water for Irrigation purposes from River Krishna to districts like Nalgonda, Prakasam, Khammama and Guntur. In order to face the increasing water demand, 680 m³/s of water will be lifted and transported over 295 km to the dam site.

Under first phase, ABB will deliver a turnkey solution including synchronous machines (n.8 of 24 MW and n.8 of 21 MW) with associated excitation equipments, LCI (Load Commutated Inverter) starting equipment, motor control and relay panels, instrumentation and SCADA system, low voltage switchgears.