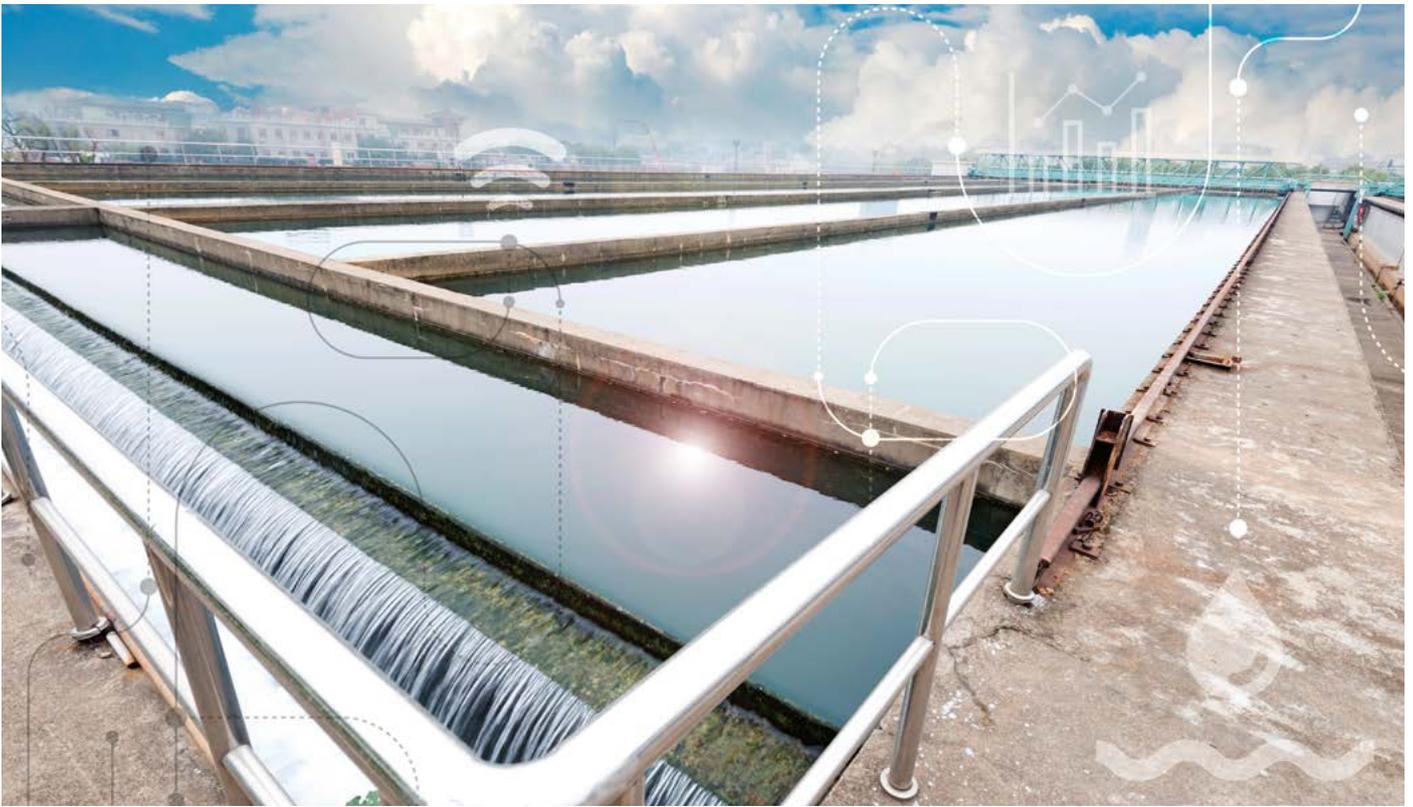




## BACSOFT CASE STUDY

# MEKOROT - ISRAEL NATIONAL WATER COMPANY



### ABOUT MEKOROT

Mekorot is Israel's National Water Company. Since 1937, Mekorot has been responsible for building and maintaining the country's water infrastructure, and supplying households, agriculture and industry. It has been an integral part of the growth and development of the country since its inception, enabling the desert to bloom and industry to prosper.

In addition to initiating infrastructure and water projects, Mekorot is also responsible for ongoing operations to ensure a regular, reliable, and high-quality water supply. Despite the many challenges of water management in the region, Mekorot operates according to the principle that water must be supplied to all parts of the country, and meet all needs at all times.

#### Mekorot's many activities include:

- Water supply and resource management
- Water quality and security
- Desalination
- Hydrology and drilling
- Effluent reclamation and wastewater treatment
- Rain enhancement and storm water catchment
- Development of water technologies and sustainable development

### THE CHALLENGE CONNECTING EXISTING INFRASTRUCTURE SIMPLY AND RAPIDLY

Mekorot has a vast network of water-related infrastructure throughout the country, consisting of many different types of equipment installed over an extended period of time. As part of an effort to continuously improve the quality and efficiency of their operations, Mekorot wanted to enable remote monitoring and control of their unconnected infrastructure, including sewage treatment plants, reservoirs, rain enhancement generators, pumping stations, and wells. >

## < THE CHALLENGE

Because of the diversity of the equipment, Mekorot needed a versatile wireless communications controller that would be easy to deploy in the field under a variety of conditions. Some of the infrastructure, such as reservoir water level monitors, could not be connected to the grid - so low power, low maintenance units were essential.

The units also needed to be small and unobtrusive enough to install in any type of location. Given the importance and sensitivity of the water supply, Mekorot had to be certain that the system would run uninterrupted and be able to withstand cyber-attacks. All of the equipment would have to be connected to the SCADA systems in their control rooms but at the same time, Mekorot wanted to implement real-time alerts and enable their service managers to monitor equipment remotely from a web browser or a mobile device.

Mekorot had connected some infrastructure using an earlier generation of wireless controller, but those systems were large, expensive, and had to be connected to the electrical grid. They were based on radio connectivity and required an upgrade to cellular. There were many locations in which it was not feasible to install them, and in terms of a large-scale rollout, they were not efficient or cost-effective.

Mekorot sought a new approach to M2M communications that would be versatile, simple, and efficient enough to meet all of their needs. They looked for a platform that was flexible and robust enough to connect everything they had, and to enable them to grow into the emerging Internet of Things.

## THE SOLUTION BACSOFT IOT PLATFORM

Mekorot chose Bacsoft to provide remote connectivity, visibility and control for various sites, including sewage treatment plants, reservoirs, rain enhancement generators, pumping stations, and wells.

Bacsoft's comprehensive IoT platform was suitable for all of Mekorot's installations. The solution included:

### M2M Communications

The Bacsoft Smart Communication Controllers have built-in support for the interfaces and protocols that Mekorot needs. Designed to operate reliably under all kinds of conditions including off-grid (battery operated), the Bacsoft Smart Controller is efficient, cost-effective and easily scalable to meet all of Mekorot's needs.

### IoT Cloud

The Bacsoft IoT Cloud handles all aspects of communications, application execution, data storage, security and auditing in a high-availability environment on the Mekorot premises.

### Bacsoft Application Builder

The Bacsoft Application Builder enables Mekorot to easily integrate the newly connected devices with the SCADA applications in the control room, to define alarms and alerts by SMS and email, and to enable remote access to data via web and mobile devices.

## RAPID ROLL-OUT, EASY EXPANSION

Bacsoft originally developed the solution through Mekorot's Watech program. WaTech®- the Entrepreneurship & Partnership Center for Water Technologies is a program which supports new innovative water technologies solutions which are relevant to the daily operation of the company.

As the initial project, Mekorot used Bacsoft to connect rain enhancement generators. With the Bacsoft Smart Controller, they quickly connected the PLCs at the rain enhancement sites to the Bacsoft IoT Cloud over a secure, private cellular network that leveraged Bacsoft's data encryption, access control and auditing features to ensure security.

They connected it to the SCADA interface in the control room and defined the alerts to be sent to management via web and mobile channels. Bacsoft performed the initial installation on-site and after just a day of training, the Mekorot team was able to continue expanding and customizing the system on their own.



**“FROM THE PLUG-AND-PLAY CONTROLLERS, TO CONFIGURING THE COMMUNICATIONS AND ALERTS, WE FOUND THE BACSOFT PLATFORM EASY TO MANAGE ON OUR OWN. BACSOFT WAS BOTH STABLE AND RELIABLE, SO WE DECIDED TO USE BACSOFT AS THE STANDARD PLATFORM FOR CONNECTING ALL OF OUR SITES AND INSTALLATIONS.”**

Senior Automation Engineer, Mekorot South

## ONE SIMPLE, SMART PLATFORM FOR ALL OF THEIR NEEDS

Following the success of the rain enhancement generators, Mekorot proceeded to implement Bacsoft at a number of additional installations including:

### Cathodic protection

Mekorot used Bacsoft to remotely monitor cathodic protection measurement points throughout the country. The sites included rectifiers from a number of different vendors that all needed to be integrated uniformly with the SCADA interface. The many off-grid measurement points were connected with Bacsoft’s low-power, battery-operated Smart Communications Controller. Since the sites are hard to access, Mekorot also used Bacsoft to remotely install system upgrades to rectifier PLCs, saving hundreds of hours of technician visits on-site.

### Valves

Mekorot deployed Bacsoft Smart Communication Controllers to control water valves remotely using the battery-powered unit for remote, off-grid locations. By connecting the valves to SCADA and a simple mobile interface, Mekorot can set timers and open and close valves remotely using an energy-efficient sleep/wake mode of the Smart Controller device.

### Sewage treatment plants

In these highly critical facilities, Mekorot had a legacy, radio-frequency remote communications solution in place. While keeping the legacy system in place as a backup, they implemented Bacsoft to connect to the SCADA in the control room and provide real-time alerts.

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## < ONE SIMPLE, SMART PLATFORM FOR ALL OF THEIR NEEDS

### Reservoirs

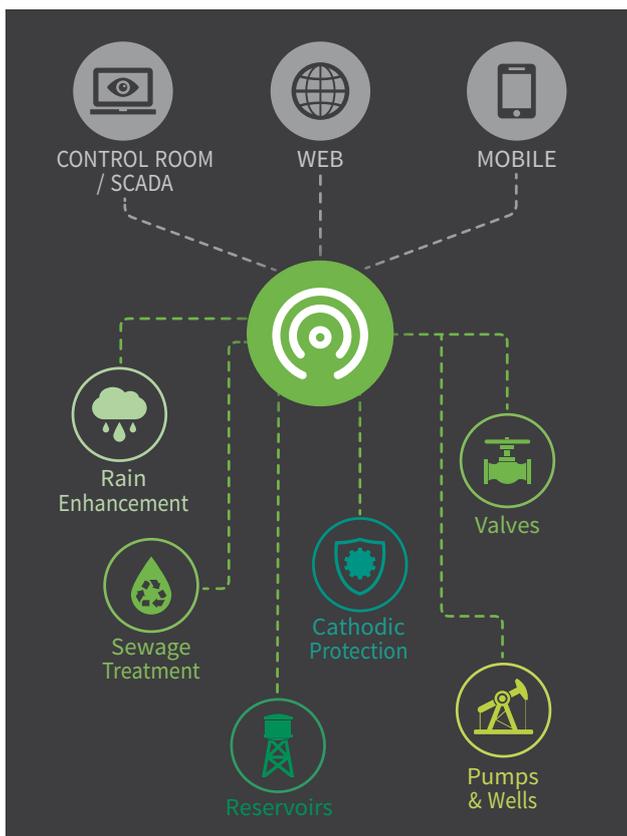
Since water-level measurement equipment is not connected to the electrical grid, Mekorot used Bacsoft's Smart Controller, which can operate for up to 5 years without maintenance. The small size of the unit was also a unique advantage on floating water sensors.

### Pumping stations and wells

At sites all over the country, the Mekorot team connected Bacsoft Smart Controllers to the PLCs that control pumps and wells in order to provide remote monitoring, command and control. In addition, managers receive real-time alerts if there are problems, and service technicians have remote access to performance data from their web and mobile devices.

**"WITH BACSOFT, WE HAVE BEEN ABLE TO CONNECT A VERY WIDE VARIETY OF SENSORS AND CONTROLLERS WITH A SINGLE PLATFORM. WE NOW HAVE CENTRAL MONITORING AND CONTROL OVER ALL OF OUR INFRASTRUCTURE AND CAN EASILY EXPAND TO ACCOMMODATE ANYTHING NEW THAT COMES ONLINE."**

Senior Automation Engineer, Mekorot South



## BACSOFT BENEFITS FOR MEKOROT

- RAPID AND SIMPLE CONNECTIVITY FOR LEGACY EQUIPMENT
- REMOTE MONITORING AND CONTROL FROM THEIR SCADA AS WELL AS WEB AND MOBILE DEVICES
- ONE PLATFORM FOR A LARGE NUMBER OF SITES AND INSTALLATIONS
- RELIABLE, SCALABLE AND SECURE CELLULAR M2M COMMUNICATIONS
- REAL-TIME, CONFIGURABLE ALARMS AND ALERTS
- EASY TO EXPAND, CONFIGURE AND MANAGE
- LOW TOTAL COST OF OWNERSHIP

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