RealiteQ worldwide case studies

SUSTAINABLE DEVELOPMENT GOALS

You can afford the Best
RealiteQ™
New Generation of SCADA & Remote control solutions

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1. Water and sewage (wastewater)

Case study 1.1: Pumping station & WWTP - USA

Background:

This pilot project is being carried out at American Water's Innovation Department as part of the company's strategy of constantly improving and increasing the efficiency of the water and waste disposal systems it operates.

For the pilot, facilities were connected and demonstrate RealiteQ System's capabilities and its compatibility with national corporate needs, to allow the subsequent connection of the various remaining Water Company facilities to this system. All that resulting in the command and control of all of the corporation's facilities being managed by a single system.

Needs:

The utility features various facilities spread out over a fairly large geographical area, ranging from sewage pumping facilities, through a waste treatment and purification facility, to a system for discharging the treated waste into the river. The vast majority of these facilities are not equipped with telemetry devices and are not connected to a comprehensive SCADA array. Therefore, no command and control exist for the various facilities and tracking their function and operation is complicated. As a result, the customer has defined a need for an advanced system that can connect all the sites to a single command and control array, quickly and at low cost

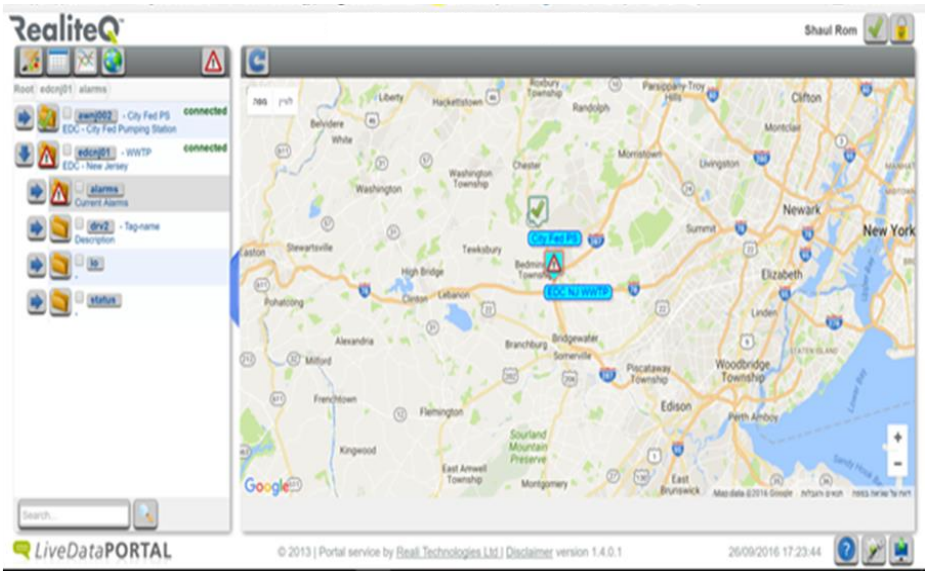
Unique capabilities:

- A cellular telemetry system and cloud-based integral SCADA, saves the cost of installing any software or applications, while allowing an unlimited number of approved users to connect to the system (subject to their authorization level) from any device (computer, tablet, telephone etc.).
- The system can be installed very quickly. Connecting both sites, including splitting measurements using analog and discrete distributors, and wiring them to end units, took the installing integrator, who has never encountered the system before, six hours.
- From the moment physical installation was completed, data began to gather in the cloud database, and the system's functioning could be viewed in real time.
- Beyond the display of the facility's real-time operational data and saving their history, effective dashboards were defined in the cloud management portal.
- The operation and maintenance personnel observe a larger amount of data and can, each according to their own authorizations, perform different actions in the system.
- The installed system is simple and easy to operate and use.
- The system and installation costs are miniscule (CAPEX) and the regular operating costs are extremely low (OPEX).

- As the system is managed, there is no need for ongoing maintenance. Maintenance and are carried out as part of the service.

OK

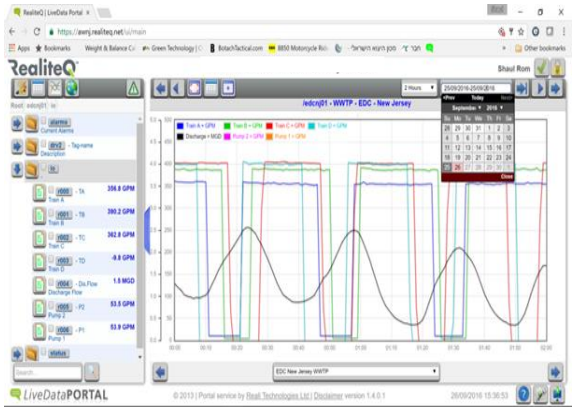
Fault



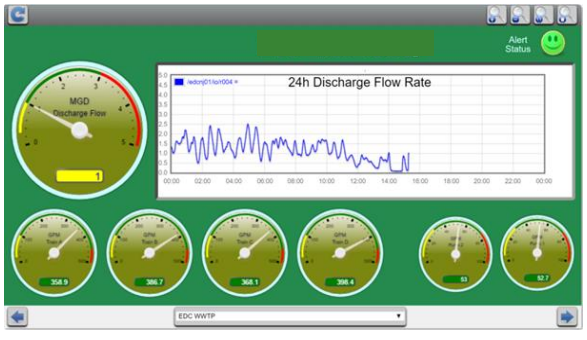
Real time Geo presentation of asset health of the two sites

Summary and results:

- The customer receives a working system within hours of its installment with no disruptions to the facilities' ongoing operation.
- Screens were defined (management and operation) allowing customers and employees to receive the required information in real time, and to operate the system from off-site in an effective, safe and highly secure manner.
- Concentration of problems read off the programmed controller, allows the manager and the operational personnel to receive email and text messages when a problem occurs and upon its conclusion.
- Access via the management interface allows one to view the problems' occurrence timetable; their confirmation time by the duty operator (including identification of implementing parties), the problems' end time and their overall duration.



Trends of pumps



Real time operational indicators

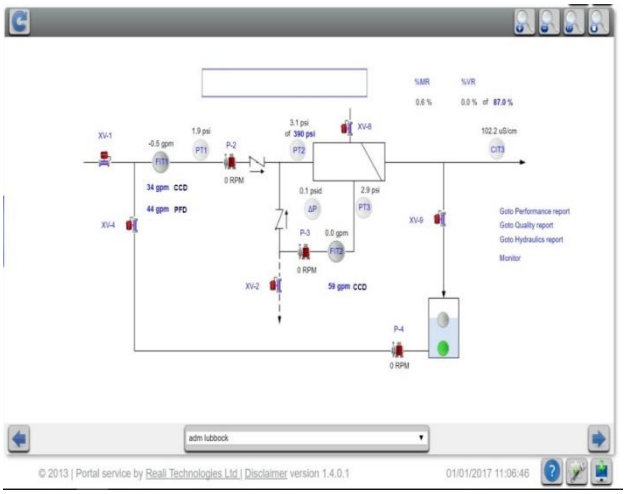
Case study 1.2: Industrial & Agricultural Desalination system (worldwide)

Background:

Israeli company supplies advanced, energy-efficient seawater desalinization systems. The system was developed in 2008 and is supplied to industrial plants around the world.

The key challenge in this project was real-time monitoring, in intervals of seconds, and enabling data collection to teach the system. This improves the process while it is in operation. RealiteQ provides reports directly to a BI system developed by the customer specifically for this purpose.

The distinction of this project is that the RealiteQ system is the supervisory and control component of the water desalination facility, which is installed at their plants in Israel, and sent to the relevant site as an integral part of the water desalinization system. In this case, RealiteQ serves as a technology provider to manufacturers of industrial water desalinization facilities.

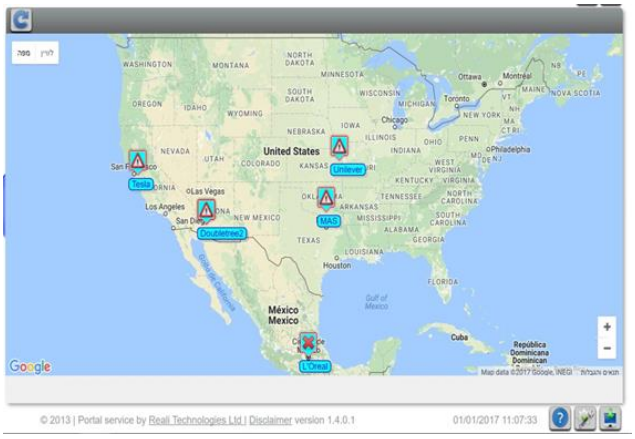


Project Description:

In 2008 the first RealiteQ systems were installed at the company's desalinization facilities in Israel, and since then the RealiteQ system has been exclusively used for this company desalinization facilities throughout the world.

Unique Capabilities:

RealiteQ solution is unique in its real-time monitoring capabilities, at the level of seconds, in its real-time response capabilities and its ability to transfer data to an external BI system in order to analyze the data and teach the system for the purpose of streamlining and improving the finished product and the service.



Summary and Results:

The fact that a unique global customer, which requires particularly precise and reliable systems for the world's leading industries known to have requirements for high quality, is using RealiteQ systems is a clear indication of the quality and reliability of those systems.

This satisfaction is a result of almost ten years of fruitful collaboration between the companies, starting from the beginning of their activity. Thanks to its innovation and openness to customer needs, RealiteQ has been accompanying the system producer ever since it began developing its systems.

The systems have been successfully installed on four continents (America, Asia, Europe, and Africa), in leading factories around the world, such as Coca-Cola, Tesla, Unilever, L'Oréal...

Case study 1.3: Water & Wastewater installations (Jerusalem, Israel)

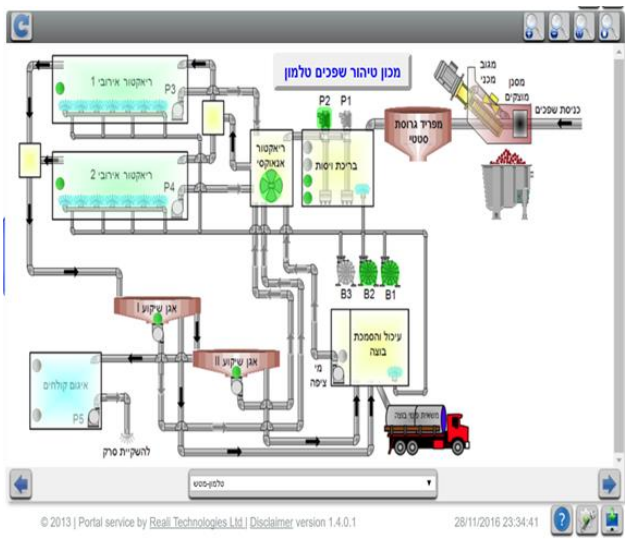
Background:

The project was carried out for a rural water authority that extends over huge areas and has great distances between the various sites.

In 2010, RealiteQ was requested to provide a solution for a dynamic control center, which enables control and operation and alerts for water and wastewater systems and for the protection systems in these installations, after previous attempts to carry out the project using different technologies had failed.

The main challenges in the project were: problematic cellular reception levels, which required an integrated solution with a number of suppliers for the same project; the requirement to enable the field personnel to have access to the system from any computer, tablet or mobile phone (including WAP); the need to set up a mobile control center, integrated with the protection systems of the installations – a connection to the security systems!

Project Description:



In the first stage, a number of medium-sized water treatment plants were connected to the RealiteQ system, and in light of the positive results, we were asked to continue adding communication units at all the important stations.

After completing this stage, the corporation decided that each new installation that it builds will have the communication capabilities according to the basic tender definitions.

Each new station is implemented from the start having a connection to the control center that we set up for them – a web-based control center that integrates graphic capabilities and operation of the installations from the field or from the corporation's premises. Currently there are over fifty active sites!

As part of the project, we supplied the field personnel with iPads with built-in cards to enable operation from the field.

Unique capabilities:

The RealiteQ system is the only one that is able to provide a solution for connecting different cellular suppliers within the same control center, and that has the ability to integrate the whole system without depending on a static IP address. (The RealiteQ system works with a dynamic IP address).

The modular advantage of being able to start from a solution for a small number of stations, without the need for a large and rigid investment, and then grow to a system with tens of installations in completely different areas, while simultaneously adjusting according to the corporation's requirements, all that at a reasonable cost and a short schedule.

The combination of different integrators to perform the work over the years, all of them able to provide the required solution without any special problems, using mobile tools, iPads, smartphones and computers…

The ability to work at sites without electricity, using a solar system in a manner that is simple and very cheap to install.

Summary and Results:

The customer is very pleased with the product and uses the system to its highest extent. The system undoubtedly has become the most important tool in the corporation's regular operations, and without it they feel as if their hands are tied behind their backs. The corporation itself sees us as partners!

Since then, we have been carrying out additional projects for the same customer, such as irrigation for farmers and remote control of faucets, which are being implemented through 2016.

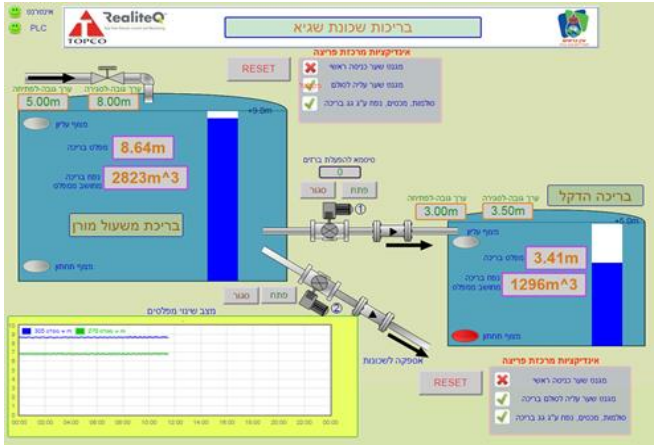
Currently, after a number of years, the project fills up and irrigates extensive areas and is able to supply and sell large quantities of water, which had not been utilized until then, with minimal operation and maintenance costs, thanks to the capabilities of remotely monitoring and fully controlling all the systems that are dispersed over a large area.

Case study 1.4: Supply of Drinking Water for Urban Utility (Israel)

Background:

In 2013, RealiteQ was asked to provide a monitoring and operating solution for a relatively small urban utility, dealing primarily with operating and taking responsibility for the drinking water in the city and also taking some responsibility for the sewage stations. To control, know and handle the regular supply of water, a real-time monitoring system was required, working 24/7, in order to operate as quickly as possible in any event.

Project Description:



his project includes 3 sites, each containing a drinking water supply reservoir for the area around it.

A control panel with solar cellular iCex was installed at each site, with command and control, level measuring instrumentation and a voltage backup system using batteries.

The system measured the real water level accurately, thus controlling a suitable filling profile according to consumer demand, and to present data and to warn about any incident.

At each site there was a homeland security system, which only provided a local warning. It has also been connected to the new system, so that it can light up and warn about any incident involving security.

Unique Capabilities:

The use of a cellular solution solved the communications problems that stemmed from infrastructure limitations and enabled interfacing the dispersed water and sewage systems (including HMS systems as

aforementioned), within a few days and at low costs, since there was no need to construct a special immunizations infrastructure for a relatively small system.

Conclusion and Results:

The project became fully operational within a few weeks, and has been achieved:

- Routine data on the water level in the reservoir. (In the past, the height of the water in each reservoir wasn't known, and it was necessary to visit each site frequently – this problem has been resolved).
- Filling the reservoir became an accurate and efficient operation and avoided the intensive handling that had been necessary in order to service the previous filling valves.
- In the event of an emergency, closing and emptying a reservoir by remote rapid action is possible.
- The warning reception system is organized for the corporation's mobile devices.
- Collecting and receiving organized historical reports about the various level conditions all year round
- The customer is satisfied, and the systems are working well, without any need for special maintenance operations.

Case study 1.5: Desalination Plant Remote control (Israel)

Background:

In 2009, RealiteQ was asked to upgrade and replace the Motorola radio system, which was highly inaccessible to both the operators and the regular service providers. The system was intended for both local and remote control at all the bores (near to the coast) that provide brackish water to the desalination plant at the control center, in order to collect data from 29 different brackish water bores and connect them to the control center.

Requirement:

An efficient, rapid, and accessible solution for controlling all the bores at the desalination plant, with operational flexibility and with ability to carry out operations, by both local and remote control, rapidly and efficiently without the necessity of being in the area.

Project Description:

The Motorola Moscad control was replaced by a programmed KOYO control for the purposes of activating the drilling itself and for local control, and, in addition, an iCex R-3.0 unit was installed, which is connected to the KOYO control and transfers the drilling data to the control center. Twenty-nine drillings were performed, most during the initial stage, and each time another bore was added... as required.

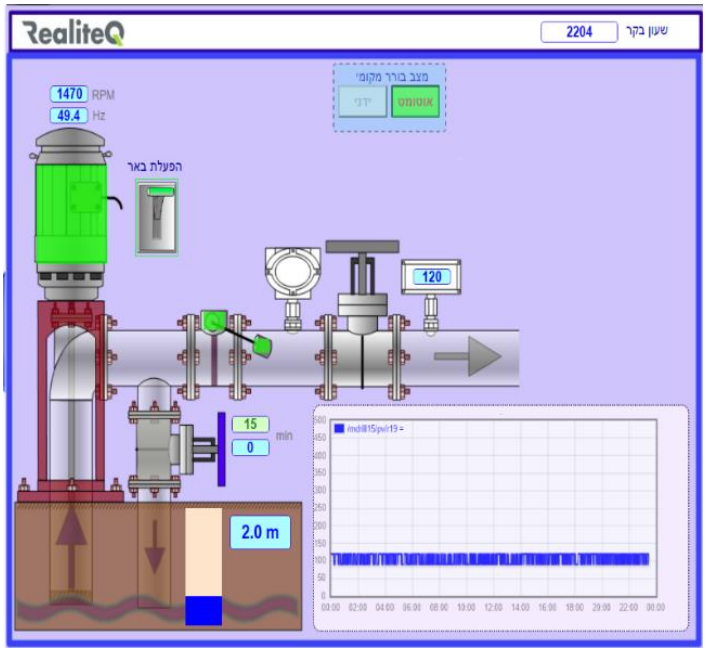
Unique Capabilities:

Interfacing and replacing the old end units (radio) by interfacing with the existing HMI systems.

Conclusion and Results:

The customer is very satisfied with the results and the extremely efficient and accessible solution, compared with the radio system that it replaced.

As a result of the customer's great satisfaction, at a later stage RealiteQ supplied a solution for additional uses for the same customer (the Kibbutz), in the generator and electricity disconnected fields.



Remote control – wells

Case study 1.6: Rural Water & Sewage Corporation (Israel)

Background:

A monitoring system for the sewage and water stations and water treatment plants of a Rural Water and Sewage Corporation, which is intended to provide a solution for the maintenance personnel for the purposes of the regular operation of the installations and water supply.

The corporation covers a very wide area with very difficult topography, so that it takes a long time for field technician to get from site to site. Furthermore, the corporation deals with a very large number of stations (about 120 in this area) and has to keep a large fleet of vehicles and personnel for regular operations; the municipality was interested in streamlining the work and the level of handling breakdowns prior to incidents of water shortage or overflows at the various installations. We went to the site at which an initial unit had been installed by another company during a pilot stage.

In 2010, RealiteQ was asked to replace the company that had carried out the pilot and to supply all the stations at which there is control, and, at a later stage, to expand to stations in which a control system has not yet been installed.

Requirements:

Command and control of the water and sewage installations at any site and at any time, at sites with or without electricity; a solution for flowing systems, and monitoring them using solar energy sources at a large number of the water installations; receiving warnings in real time regarding the height of the sewage station; problems

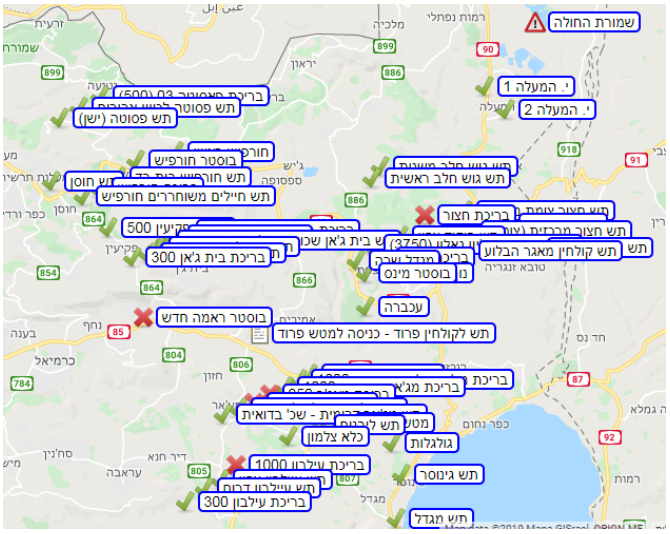
at the stations; the possibility of monitoring breakdowns over a 24-hour period, and a solution by analyzing the stages of the breakdown according to the history of the installation, protecting the equipment.

The first installation - replacing the system that had been installed by another company in the pilot that was carried out at the site. In fact, this installation served as the pilot for RealiteQ system, and, as a result of its success, the pilot has been expanded into an ongoing project.

Project Description:

During the first stage, we added communications units to all the stations at which this was possible without carrying out complicated electrical work and without replacing equipment.

On completing this stage, the corporation decided that each new installation that is set up would be provided with a communications capability as defined in the basic tender. Today, each new station is implemented from the start with a connection to the control center, the establishment of which includes an online control center, which combines graphics capability with the operation of the installations from the field or from the corporation.



Within the framework of the project, we provided the field personnel with iPads with built-in SIM cards, for operating from the field.

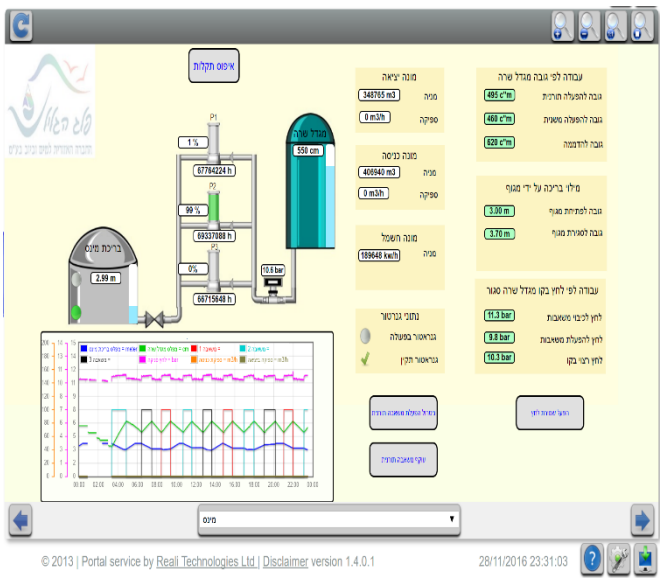
Unique Capabilities:

A modular capability to start from a small (but still economic) specific solution and to grow into a system of dozens of installations in totally different fields, by making immediate adaptations according to the corporation's demands. Working and interfacing with the various products and integrators that performed the work over the years without any special problems, using mobile tools such as iPads, smart phones and computers...

Work capability at sites without electricity, using an easily installed and inexpensive integral solar system.

Conclusion and Results:

The customer is very satisfied with the results and uses the system at a very high level. We can say, without doubt, that the system has become the most important tool in the corporation for improving regular operations, and, without it, the employees would feel as if their hands were tied behind their backs. Currently, this project, which started as a single pilot, has grown into many dozens of installations. and, in fact, constitutes the customer's standard for all water and sewage installations in the corporation.



Case study 1.7: Remote Control Operation of Water & Sewage Plans (Israel)

Background:

In 2009, RealiteQ was asked to provide a solution for monitoring and operating the sewage and water stations of medium urban utility. The system was intended to provide a solution for the maintenance personnel for the purpose of regular operation of the various installations that are spread over the Kfar Saba region, and to know what is happening at any given time, breakdowns, levels, the current conduct of the stations.

Requirements:

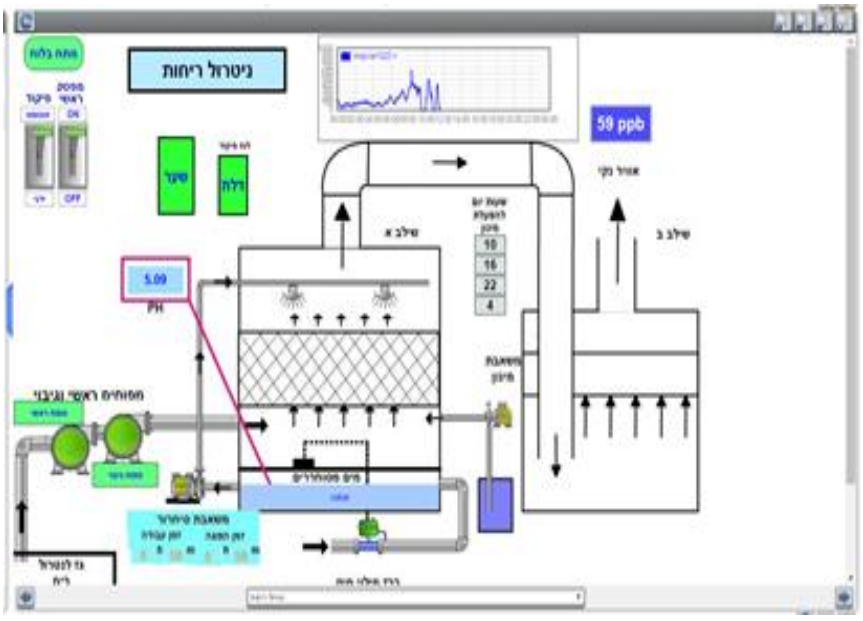
Command and control of the water and sewage installations from any location and at any time in a wide geographic area of the municipal authority and nearby rural settlements.

Project Description:

The project was carried out using various external integrators during the project, which has already continued for a number of years, and which included equipment – a programmed control for the station plus an iCex – R3.0 unit.
The project was carried out in stages, with the initial stage including 2 installations; it was expanded later, so that, currently, all the stations in the corporation are connected to the RealiteQ system.

Unique Capabilities:

The project was carried out at different stages by various integrators, all of whom are connected to one system, as a result of adaptation to a wide range of uses and equipment. The operating flexibility and the simplicity of the installation enables each integrator to learn about the system and install it, rapidly and without any difficulty.



Conclusion and Results:

The customer is very satisfied, and, after the initial stage in which only two installations were connected to the system, all the corporation's other water and sewage installations were also connected to the system, which has become the corporation's standard.

Case study 1.8: Monitoring & Control of Drinking Water Wells (Israel)

Background:

In the Lev Hasharon area in central Israel, there are a large number of wells that were intended for pumping groundwater for purposes of drinking and irrigation of orchards and farmlands, which were in use for many years. In recent years, however, these water sources gradually decreased, due to the decline in water quality, and the drying up of large sections of the orchards; some orchards have even been abandoned.

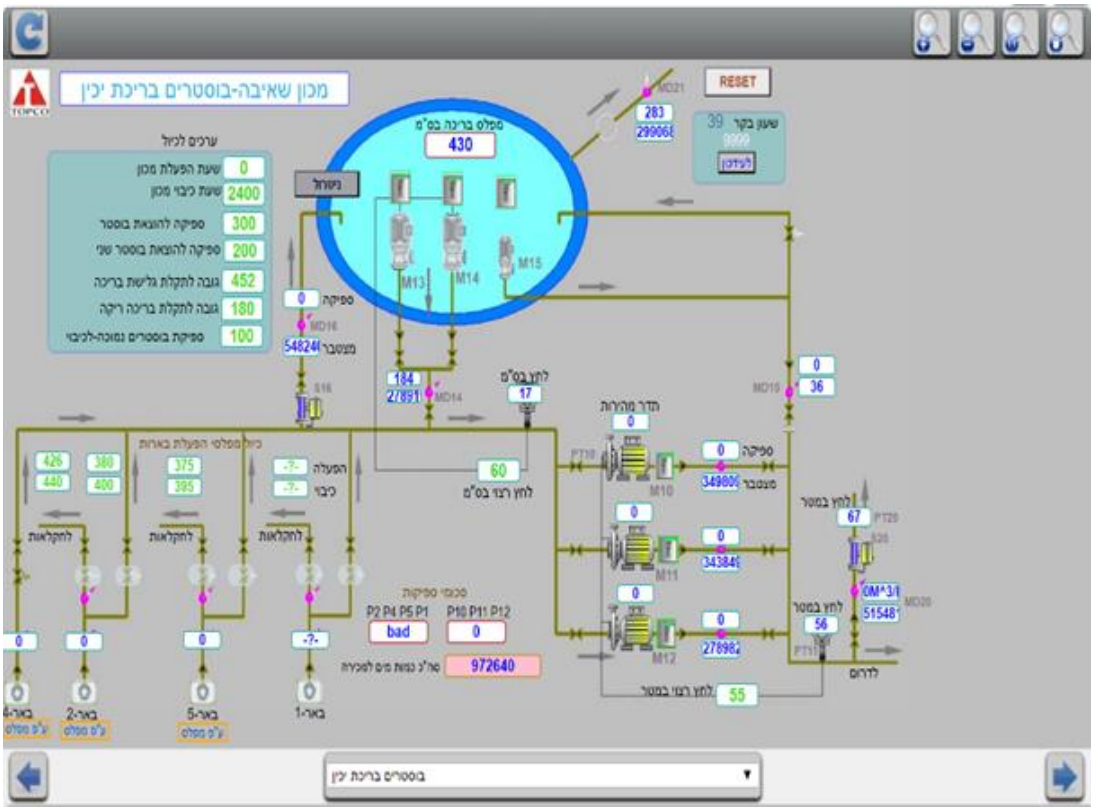
In the year 2010, RealiteQ was asked to provide a monitoring and control solution for a new project, which utilized these water sources, and also channeled the unused water to remote areas according to demand, by using a new infrastructure that channels and collects the water into reservoirs and pumps it to remote areas.

Project Description:

The project was carried out in two areas; in each of the areas a reservoir was created, which was filled up by water pumped from water wells in its vicinity. Each well was used for routine irrigation of farmlands, and at times when irrigation was not required, the water was pumped into the nearby reservoir, and from there supplied to more remote farmlands, according to demand.

A control panel was installed in each well, with cellular monitoring units (R3.0), a control unit for collecting data and controlling the end equipment that is present onsite.

RealiteQ's monitoring and control system enables changing the operation of each well, as required, when it is not needed for local irrigation, and channeling its water to fill up the reservoir; this is done by synchronizing all the wells so that they operate in a coordinated system and are only activated when there is a demand to fill up the remote reservoir.



Unique Capabilities:

Building a central real-time monitoring and control system – that is able to collect data simultaneously from all sites, and, by using software in the central controller, is able to synchronize the information and operate the system accordingly – was an essential condition in order to control a number of water sources that are distant from one other and also to fill up a central reservoir, thus providing water to near and remote fields, according to specific independent demands. The RealiteQ system, which is based on real-time data and a central server to which all the units are connected, enabled carrying out the project in good time and at attractive costs, since there was no need to build a special communications infrastructure or to invest in separate telemetric and SCADA systems. (RealiteQ is an integrated system from end to end.)

Summary and Results:

This project reviewed is very complicated – optimizing the operation of the wells in coordination with filling up the reservoirs posed a technological challenge.

In the first stage, only the operation of the wells was implemented, regardless of the water level in the reservoir, and only after that was it possible to see all the wells' operations on one screen – the logic was refined and synchronization between the wells was carried out according to the water level in the reservoir.

Currently, after a number of years, the project fills up and irrigates extensive areas and succeeds in supplying and selling large amounts of water, which were not utilized previously, with minimal operation and maintenance costs, thanks to the capabilities of remotely monitoring and fully controlling all the systems that are dispersed over a large area.

Case study 1.9: Water Supply efficiency in water utility (Mexico)

Project introduction:

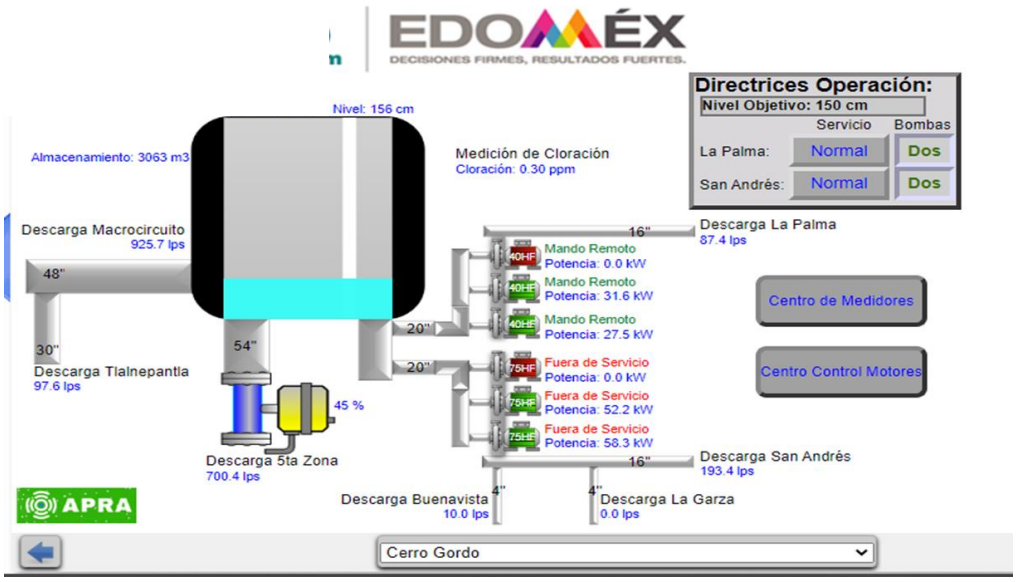
In one of the leading water utilities in Mexico, during the years and due to human errors or the absence of personnel in the facilities, at least two sewage overflows have been registered in dams that have affected the population and a flood of facilities in a drinking water storage tank. Both events lead to higher operating expenses for commissioning company in terms of inconvenience to the population and repairing cost of damaged facilities.

The Challenge:

The facilities operation was entirely manual. Each facility had its own operational personnel who report to different regional managements. The noting down of readings was manual with unreliable metrics such as scales drawn on the wall, or paint marks in the case of the valve opening control. The operation of pumps, motors, electrical circuits and others, were manual and depended on human intervention for stopping / starting.
There was no preventive maintenance. Only flow rate was measured, and the readings were noted and calculated visually in front of the local instruments. Calculations were done manually, and Data obtained from instruments between One hour and Four hours were transmitted verbally by radio.

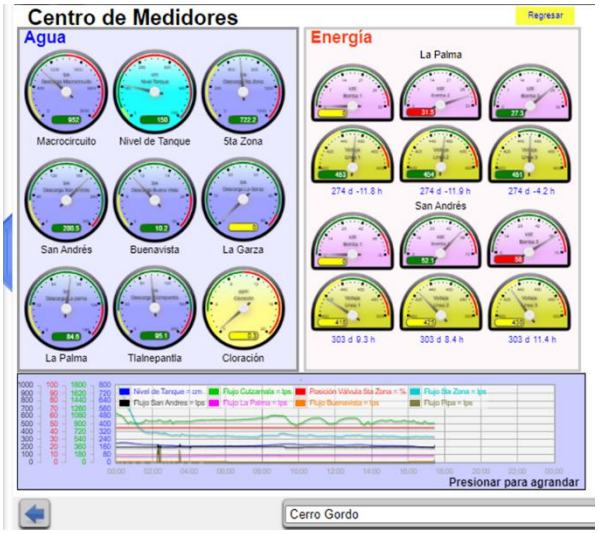
The Solution:

The project started with a single installation with complex operation of Cerro Gordo station which receives flow from one of the main federal macro circuits that transport drinking water and pump it back to four sectors of densely populated cities that reach 1.4 million people.
APRA applied complete solution, including high level local automated control, connected to RealiteQ.



The Project includes:

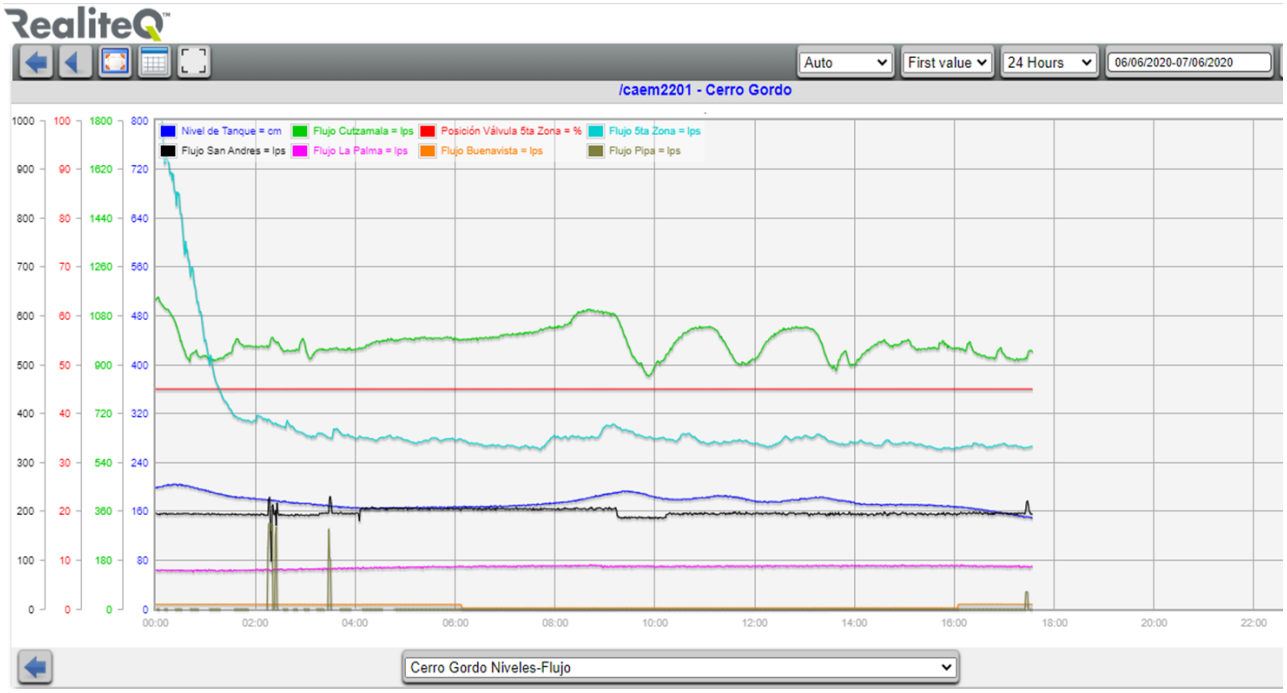
- Installation of electrical and communication network engineering to comply with the project specifications at each site.
- Automation configuration: networking, device programming, provision of various measuring instruments and sensors.
- 24/7 permanent maintenance of the automation system: maintenance and replacement of any device required in the operation of the tanks.
- Remote monitoring and control of site operation 24/7 from any place.
- All sites are connected to one centralized remote monitoring and control system.



The project objectives:

- Remote monitoring and control of site operation 24/7 from any place.
- The facility can be operated under the guidelines authorized by the Operations DG remotely and in real time, without restriction of schedules or the distance it is.
- Values of all measured and controlled parameters are presented in real time in an intuitive, easy to follow manner.

- Historical data of important measured parameters enables optimizing of different parts and the whole process.

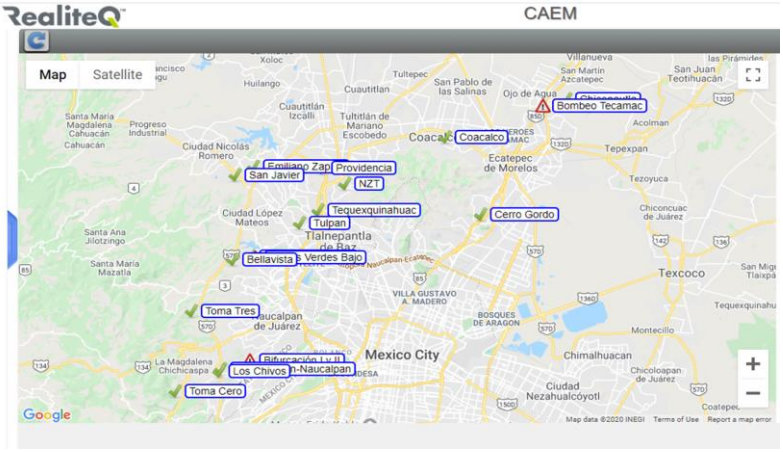


The Results:

- Increase in safety in the operating guidelines.
- Service without interruption.
- Stability in different basic parameters, such as:
  - Storage levels.
  - Exact water consumption for each circuit.
- Significant savings of water – about 50%
- Significant savings of electrical power – about 50 %

The Extension:

As for the success of the first installation, the project was expended to 20 sites and the plan is to connect all the sites along the distributor system to RealiteQ in order to have one centralized remote-control operation and management system to the entire water network.



Case study 1.10: Monitoring Quality of Drinking Water (Vietnam)

Project introduction:

This project was done in one of the water utilities in Vietnam. There are 6 parameters measured:

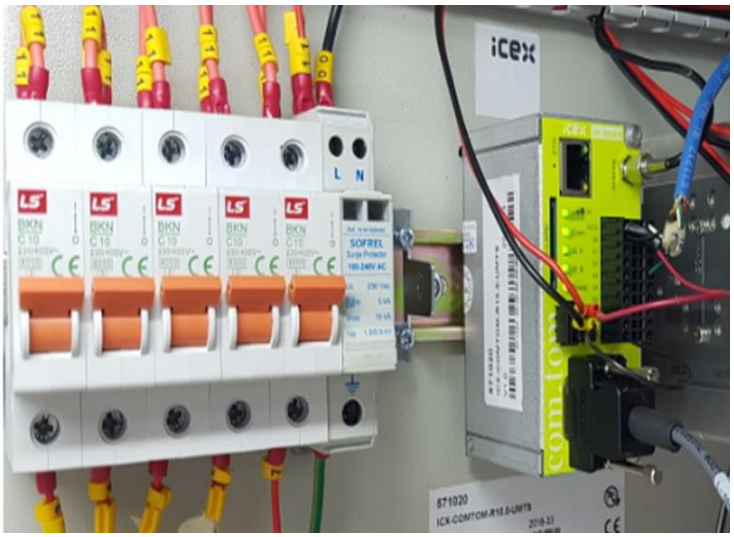
- Temperature
- pH
- Salinity
- Transparency
- Conductivity
- Chlorine

Sensors are connected to 4 smart instruments (two of them are holding two sensors each). The instruments have liquid crystal monochrome displays, where values of the measured parameters are shown.
3 of the instruments are more advanced and have both RS485/Modbus and analog signal (4-20 mA) retransmitting interface. But it turned out that via RS485/Modbus only one parameter can be transmitted at a time. The 4th instrument is simpler and has only analog output.

The Challenge:

The sensors and the cabinet with the instruments are in the backyard of an archive warehouse in suburb of Saigon. Due to heavy traffic, the access to the instruments is time consuming. The site was visited sporadic by the utility employee, who was writing down the values on paper and reporting them when returning to the office.

Such information is very partial, not precise, and practically useless.



The Solution:

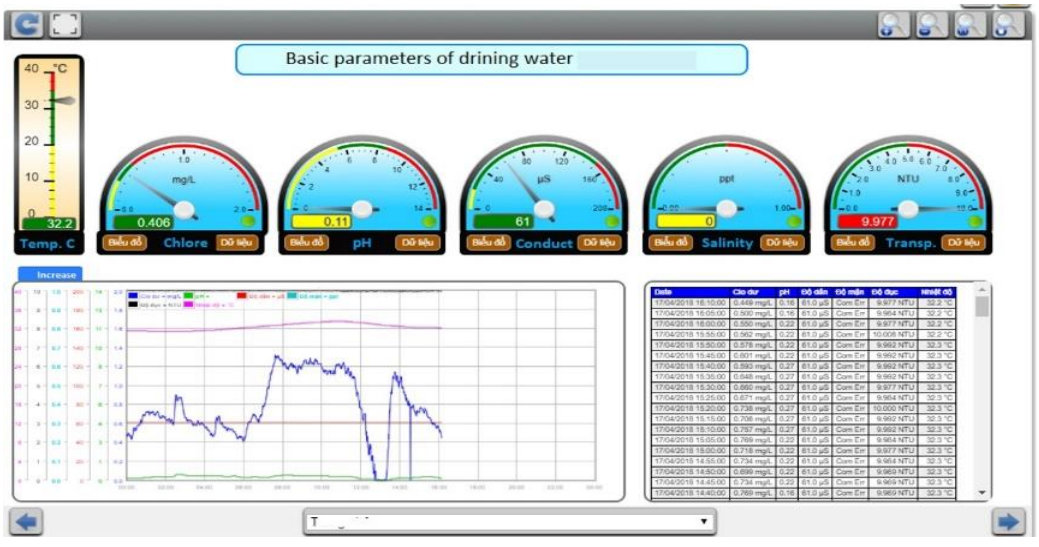
The utility has decided to connect the smart instruments to RealiteQ. This will provide continuous reading of all parameters in real time, as well as historical data in time-stamped tables and trends.
iCex model ICX-COMTOM-R10 was installed in the cabinet. RS485 network was built to read 3 of the parameters. The other 3 parameters were connected to analog inputs of iCex.

The installation:

Wiring, programming iCex and smart instrument, building Project tree in RealiteQ, checking the connection, reading and calibrating both instruments and analog inputs of iCex was done in the field in the morning for about 3 hours – by distributor's engineer and technician.

The Results:

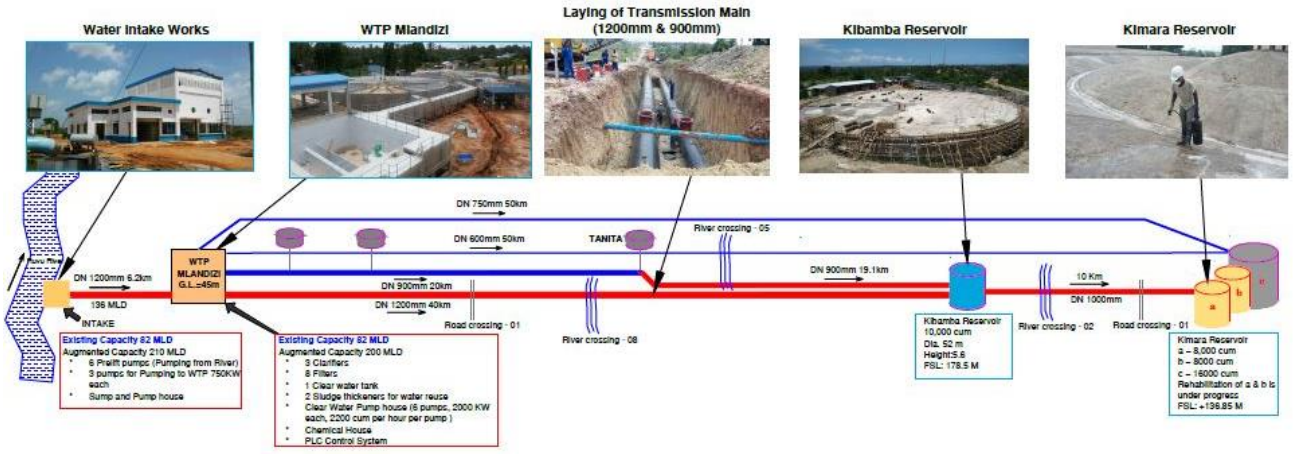
In the end of the installation the costumer got a real time information with dashboards, graphs, trends, alerts… this information could be reached only by authorized Employees and managers in the control room, as well as from any device connected to the internet with no need to install any software or application.



Case study 1.11: Dar Es Salaam Water Supply System (Tanzania, Africa)

Project introduction:

Dar Es Salaam (Tanzania) water distribution system suffering from water shortage and intermediate water supply. And in order to improve the water availability they have built an extension to the existing water treatment plant and built a new transmission line from the Upper station to the city of Dar Es Salam

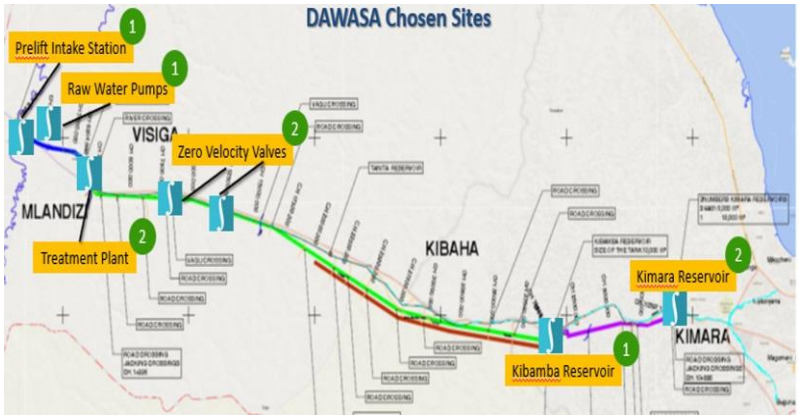


Scope of work

The Scope of work includes connecting 8 sites along the line to RealiteQ SCADA system and monitor the flow and the water level in the several sites along the same line.

The following sites were connected to RealiteQ SCADA:

- Prelift station
- Raw water pumping station
- Raw water transmission line
- Water treatment process
- Treated water transmission pipelines
- Kibamba reservoir
- Kimara Reservoirs

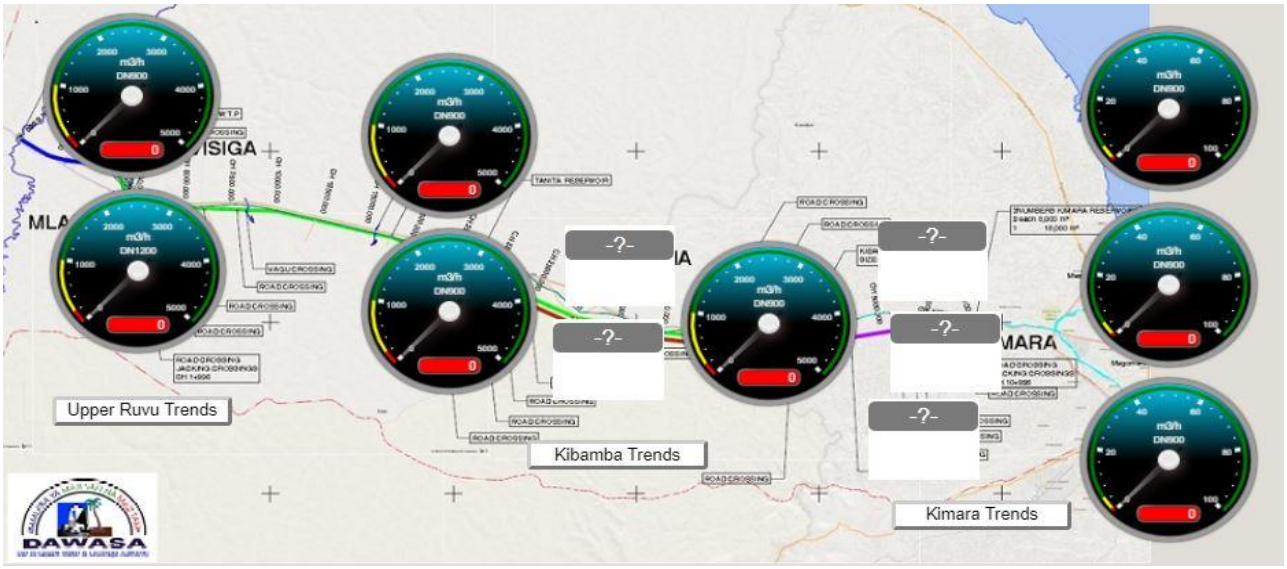


The Solution

In the different location the Pumps, flow meters and water level sensors in the reservoirs were connected, and real time data was presented, as well as calculated data and historian data. The installation of all the 8 sites took 5 days by two filed technicians.

The project installation includes:

- RealiteQ ICex installation
- Water level sensor installation
- Project activation
- Configuration of RealiteQ portal (graphical screens/Dashboard, Variables, Reports, Trends, Alarms).



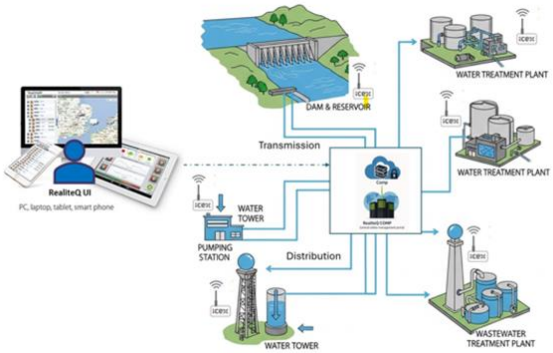
Case Study 1.12: Centralized control Center in Regional Council

Background and The Challenge (The Decentralized Rural Utility)

The project scope involves Rural Water and Sewage Corporation in Menashe regional council – Israel **spanning a vast, geographically dispersed region (approximately 160 km^2) that serves numerous small, rural settlements (agricultural villages).**

The water and wastewater infrastructure of Menashe regional council is **highly decentralized,** encompassing different water systems with different facilities across the area, including:

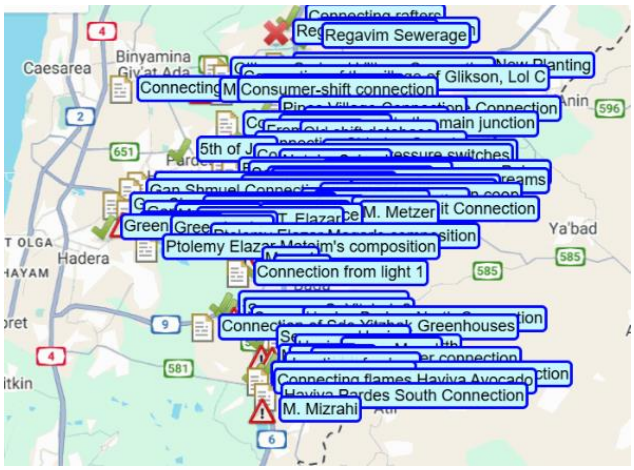
- Water and Wastewater Pumping/Lift Stations
- Wastewater Treatment Plants (WWTPs)
- 14 Water Reservoirs and pressure boosting stations
- Remote consumer heads, some operating via solar power.
- Valves, Watermasters, pressure sensors, water quality sensors, water level sensors, distributed in the whole area...
- Generators, outside lightning of the facilities...



Key Operational Challenges:

1. **Geographical Dispersion and Response Time:**
   The wide area and difficult topography result in long travel times for field personnel between sites. This leads to high vehicle fleet costs, high manpower requirements for routine operation, and critically, slow response to emergencies (e.g., sewage overflows or water shortages).

2. **Economic Barrier (CAPEX/OPEX):** As a small/medium utility, the regional council faces an impossible dilemma: it cannot justify or afford the high initial capital investment (CAPEX) and the recurring operational expenses (OPEX) of building and maintaining a dedicated, 24/7 manned central control room.
3. **Manpower Barrier:** The difficulty in recruiting, training, and retaining the highly skilled IT professionals and cybersecurity experts required to manage and maintain a modern, proprietary control system.

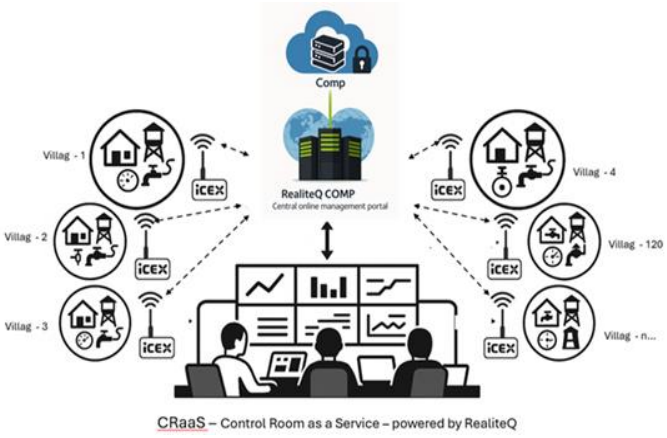


The Solution: CRaaS - Control Room as a Service

Menashe Regional Council adopted the **CRaaS (Control Room as a Service)** model, powered by the RealiteQ platform. This model transforms control and monitoring from a high-cost capital project into a manageable, all-inclusive **monthly operational service (OPEX)**.

CRaaS Implementation Components:

1. **Smart Edge Units (iCex):** Each remote site (pumping station, WWTP, reservoir…) is fitted with an iCex **(Integrated Cellular and Ethernet eXplorer)** unit. This smart dedicated gateway acts as a Data Producer, communicating directly with the local PLC/controller or with field sensors, ensuring real-time data acquisition from the edge**.**
2. **Secure Communication as a Service:** The iCex units communicate securely (via cellular/Internet) with RealiteQ's central cloud server **(COMP - Central Online Management Portal)**. This architecture eliminates the need for expensive, complex communication infrastructure like fixed IP addresses, VPNs, or dedicated radio telemetry systems, simplifying the network architecture significantly.
3. **The Centralized Control Room:** The team of Menashe regional council use **RealiteQ Cloud-Native SCADA HMI** – a centralized, secure, cloud-based platform –accessible via any standard web browser. This service unifies all data from all dispersed facilities into a single operational interface.



Operational Capabilities and Results (CRaaS Value)

The CRaaS model provided the rural corporation with the advanced monitoring and control capabilities of a large metropolitan utility at an accessible operational cost**.**

A. Centralized Control and Process Optimization

- **Full Remote Control:** Operators can view the entire water and sewage process and execute control actions (e.g., changing setpoints, operating chemical pumps, controlling reservoir inflow) from any location using a computer, tablet, or smartphone.
- **System Synchronization:** The full real time remote control, provided by RealiteQ facilitates the coordination of widely dispersed systems. Now it's easy synchronizing well pumping operations **with** reservoir water levels. As result, this optimization led to **significant savings in both water and electrical power** consumption.

B. Improved Response and Maintenance Efficiency

- **Real-Time Alarms:** Immediate notifications are received for critical faults (e.g., sewage pump failure, low chemical levels), enabling rapid response before a crisis (such as a sewage overflow) to occurs. Analyzing real time and historical data in COMP enables generating messages for urging changes in the system, which enable predictive maintenance.
- **Mobile Operations:** Field maintenance crews are equipped with tablets, granting them 24/7 full system access. This drastically reduces the time and distance required for routine inspections and accelerates fault diagnosis and resolution.

C. Flexibility and Scalability

- **Solar Support:** The system supports operation at remote sites without local power via integrated, easy-to-install, and inexpensive solar power panels.
- **Modular Growth:** The project started as a small pilot and was expanded in stages, seamlessly integrating with different vendors and equipment over time. It has now become the operational **standard** for all new and existing water and sewage installations within Menashe regional council.

Conclusion: The CRaaS model successfully delivered a modern, cloud-based SCADA solution to the Rural Water Corporation. By overcoming the financial and personnel barriers, which are typical for decentralized rural areas, the system provided full command and control over hundreds of dispersed assets, making it "the most important tool in the corporation for improving regular operations".

Case Study 1.13: RealiteQ Implementation – Anaerobic Waste Processing Plant

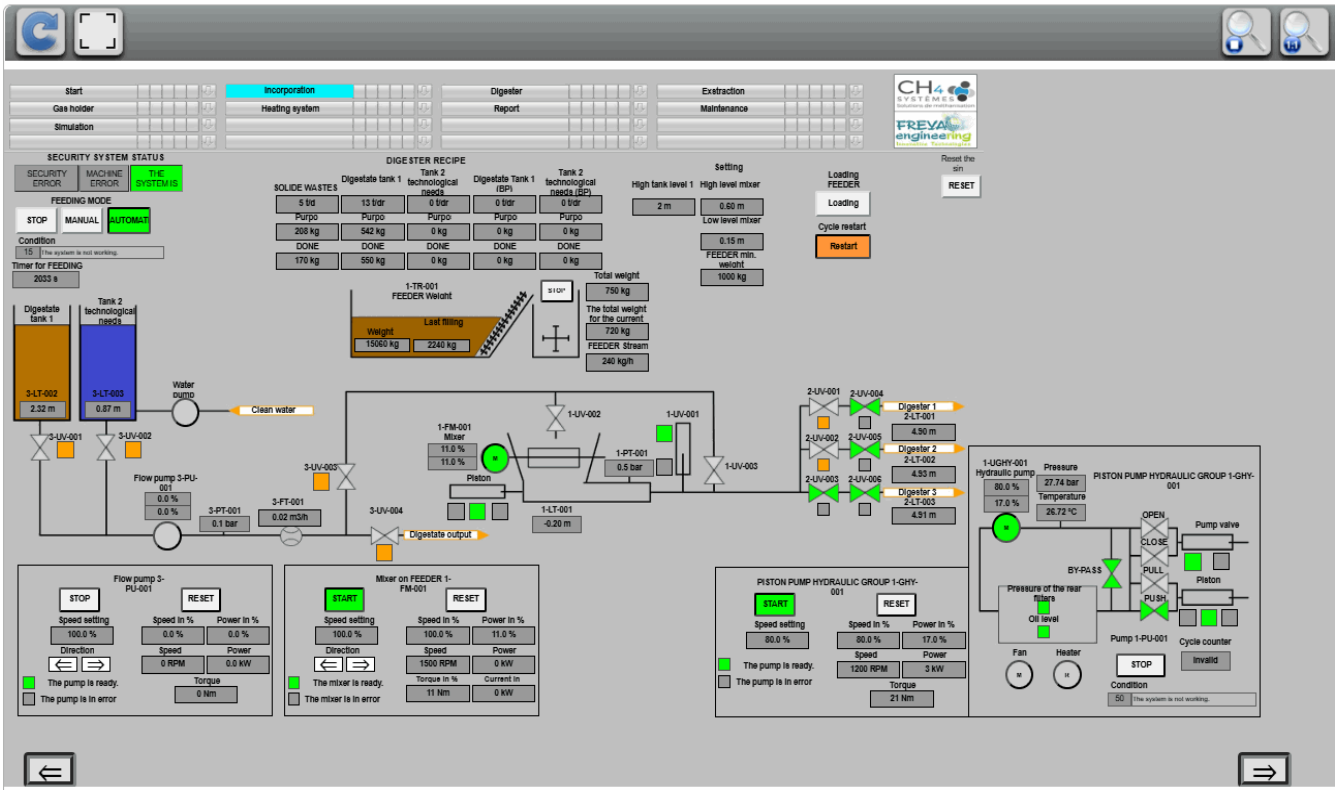
Background

The Ruse installation is a large-scale facility for anaerobic processing of household and biodegradable waste. Covering approximately 25,000 m², it handles up to 17,000 tons of biodegradable material annually. The waste is processed through composting to generate biogas, which is converted into electrical energy or burned under controlled conditions. This complex operation requires continuous monitoring of multiple variables, including input material size, gas generation estimates, leakage alarms, shredder and crusher status, valve positions, and real-time control of numerous subsystems.

Client Requirements

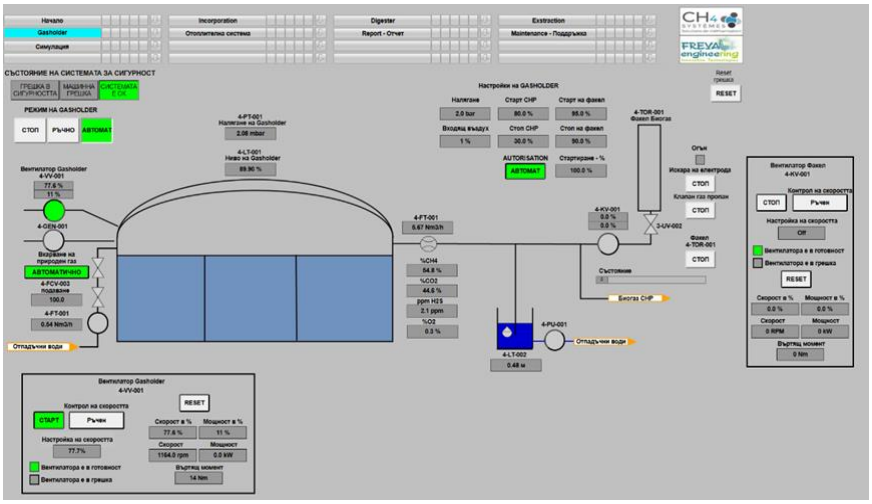
The client needed robust, real-time monitoring and control solution capable of:

- Managing multiple PLCs across the installation.
- Ensuring reliable connectivity in challenging environments (e.g. deep shafts).
- Supporting diverse communication protocols and handling PLC-specific data formats.
- Providing intuitive visualization for on-site personnel despite process complexity.



Solution Overview

Reali Technologies implemented the **RealiteQ cloud-based SCADA and IIoT solution**, integrated with iCex edge devices to deliver secure, flexible connectivity and advanced control capabilities.
Key functional areas included:



- **Connectivity and Protocol Support:** iCex devices support Ethernet and mobile data backup for uninterrupted communication with COMP – RealiteQ software in the cloud. In other side iCex is supporting the most popular industrial communication protocols via RS-232, RS-485 and Ethernet. Features like “swap word” and “swap byte” simplified integration with non-standard PLCs.

- **Real-Time Monitoring:** Continuous data acquisition from PLCs allowed precise tracking of shredders, crushers, valves, and gas generation processes.
- **Cloud Visualization:** The RealiteQ platform provided dynamic dashboards for operators, ensuring clear visibility and easy interaction with complex systems.
- **Predictive Control:** High-frequency sampling enabled accurate gas generation forecasts, optimizing compost input for maximum energy conversion or controlled burning when necessary.
- **Remote Access:** Maintenance teams could securely monitor and manage subsystems from any location, improving responsiveness and reducing downtime.

Results and Benefits

- Centralized, real-time visibility across all operational processes.
- Increased reliability through redundant communication channels.
- Enhanced safety with proactive gas leakage alarms and system health monitoring.
- Improved energy efficiency via accurate gas generation predictions.
- Simplified integration with diverse PLCs, reducing commissioning time and costs.

Conclusion

The implementation of RealiteQ at the Ruse anaerobic waste processing plant transformed a highly complex operation into a fully connected, smart facility. By combining robust edge connectivity with cloud-based visualization and predictive analytics, RealiteQ delivered operational resilience, safety, and sustainability for one of Bulgaria's most advanced waste-to-energy projects.

2. Industry and Chemicals

Case study 2.1: International chemical company - OEM (Worldwide)

Background:

One of our major OEM customers is an international chemical company with two centers, one in Europe and the other in the United States. The U.S. center is responsible for all North American activity and the European center is responsible for activity in Europe and the rest of the world (particularly in South America and Asia).

The company provides, among other things, a water treatment system for paper-manufacturing plants around the world (hundreds of factories), with the chemical, the company also provide the dosing unit which inject the chemical to the water in the manufacturing process to keep high PH as required and is responsible for operating and for the regular supply of chemicals for these systems.

The project's key challenge was to enable full real-time Monitoring control of many dosing units located in different sits around the world with minimal manpower and maximum uniformity, so that each constituent (product managers, region managers, sales managers, and technical personnel) could see and operate their areas of responsibility easily and simply.

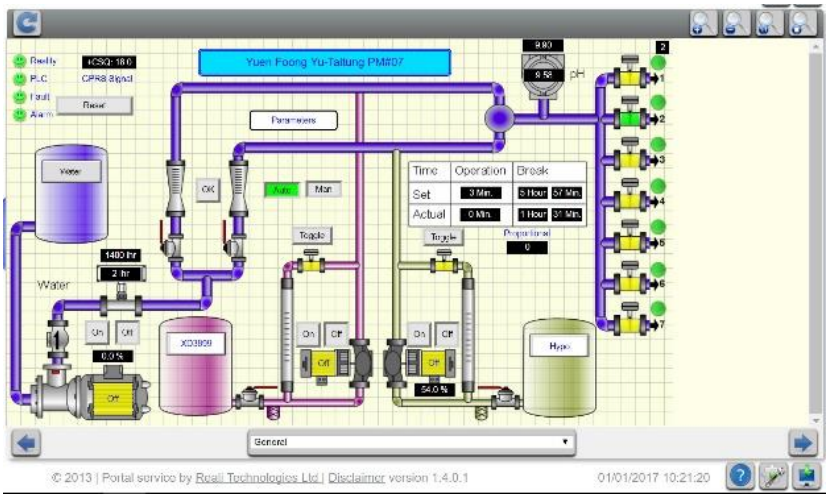
After examining the alternatives on the market, RealiteQ selected to provide the system to all the company's facilities around the world.

This project's distinction is that the RealiteQ system is the remote Monitoring and control component of the dosing units, and in effect constitutes part of the product Company provides to the end customer (the paper plant). In this case RealiteQ serves as a provider of technology to the manufacturer of industrial water treatment facilities.

Project description:

In 2008 RealiteQ systems installed for the first time by the Chemicals company in water treatment facilities at paper plants in the United States to test the system and compare it to other solutions on the market that the Company tested.

Each new installation carried out in advance with a connection to the relevant control center we built for them. Activities are divided into four control centers (the US., Europe, Asia, Latin America) – internet control centers that combine graphical capabilities with operation of the facilities from the various paper plants. There are currently many hundreds of sites operating around the world...



Unique capabilities:

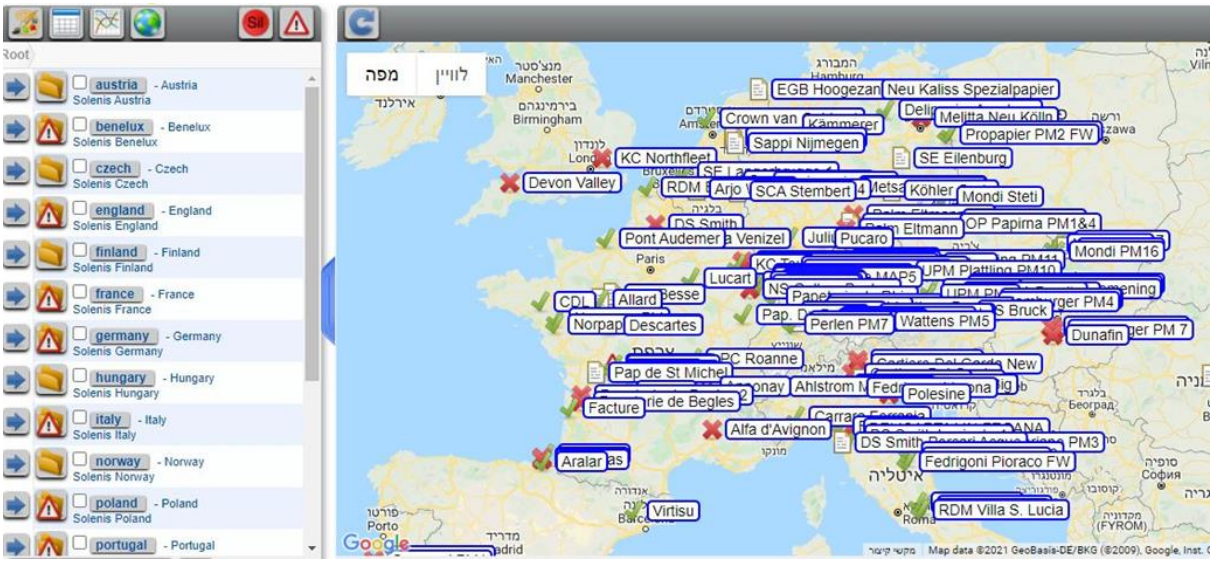
The RealiteQ solution was the only one that gave the option of building several online command centers to

control the high distribution of the systems around the world. It combines a very high level of network security great user-friendliness so that different people can access the system for different levels of use, with no security problems. It can provide different people with selective access to different sites through the same system, with no risk of anyone accessing sites they are not authorized to access.
RealiteQ has the modular ability to start from a solution for a limited number of stations without a major and rigid investment and grow into a system of hundreds of facilities around the world. It can connect additional people around the world without the need to install servers or specific software for this purpose.

Summary and results:

RealiteQ system was selected as the Company's exclusive real-time remote control of the dosing units for paper plants, and in 2012 a long-term agreement as signed to connect all of the existing and new facilities at its paper plants around the world.

Today RealiteQ support hundreds of Dosing units in more than 20 countries for thus supplier alone.



The fact that a major global customer like Company, who sought various solutions and alternatives around the world, decided to enter a regular arrangement with RealiteQ, speaks for itself – particularly considering the fact that this collaboration has been going on continuously for eight consecutive years, with new purchases each year!

The system provides Company with real-time information on the quality of water in its various plants, enables it to remotely alter the dosages of chemicals at facilities as needed, be updated regarding problems in real time and know the amount of chemicals at each facility to improve the logistics for supplying chemicals to the various facilities.

Moreover, Using RealiteQ reduce the dramatically the need to send filed technicians for the different plans for maintenance and repair as most of the control can be done remotely, actually some of the technicians were moved from technical support position for sales…

Thanks to the RealiteQ system, Company manages to remotely operate all of its water treatment facilities at their paper plants on four continents (America, Asia, Europe and Australia) with minimal personnel.

Today, as for the success of this project, RealiteQ provides a similar solution to several other Global Chemical suppliers which are using RealiteQ worldwide.

Case study 2.2: RealiteQ System interface with GE system (Austria)

Background:

A local distributor and integrator of GE control systems in Austria was looking for a real-time communications system that would transmit the data of the controllers he provides to Austrian municipal water and sewage authorities.

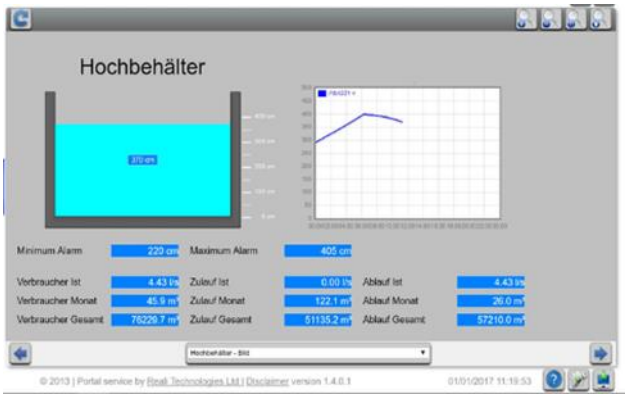
The challenge in this case was to be able, on one hand, to provide a comprehensive system (communications and UI) where needed, and on the other hand, to provide communications that interface with existing UI systems at the premises of other customers through a Reali OPC server.

In this case, RealiteQ is in effect a technology supplier for the integrator in this country, who receives a solution adapted to the specific needs of various customers, while interfacing with appropriate UI systems and end systems as needed.

Project Description:

In 2009 RealiteQ was asked to provide a solution for three sites in Austria for real-time monitoring and

The systems were provided as part of a local integrator's need to provide a complementary system of communication and remote control for the controllers he provided, which would be able to interface with existing systems of the municipal water and sewage corporations.

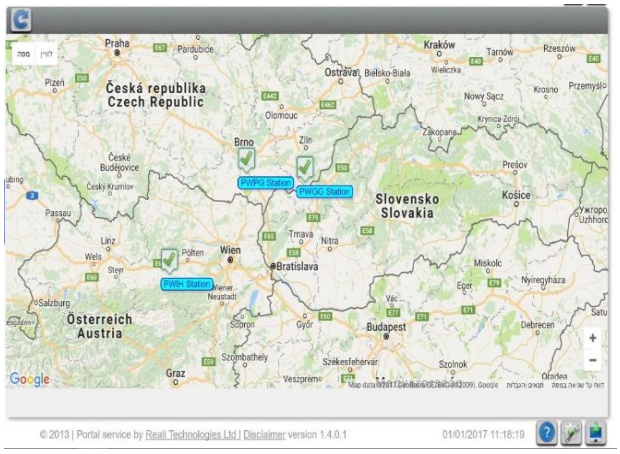


Unique Capabilities:

The distinction of RealiteQ solution is the versatility of the interface, which enables it to provide a solution in accordance with requirements, from a comprehensive solution including communications and UI, to a communications solution that interfaces with customers' existing UI systems.
Prominent in this project was RealiteQ ability to remotely support an individual integrator and provide a reliable and versatile solution in relatively small quantities.

Summary and Results

In light of the project's success, the collaboration as continued, and there are currently, there are currently a few dozen sites active in Austria for municipal customers who receive real-time data for a variety of different UI systems, to the satisfaction of both the integrator and the customers



Case study 2.3: Smart industry remote control & data management (Israel)

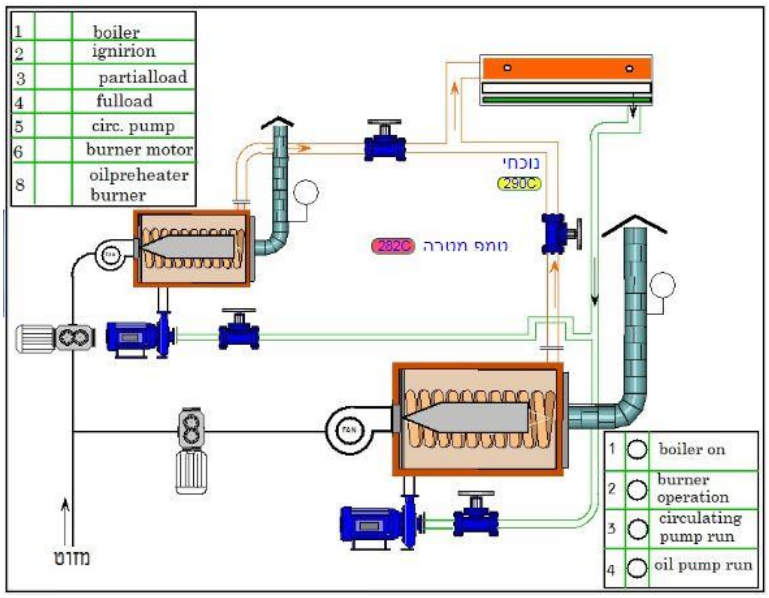
Background:

Leading company in the Israeli market and one of the leaders worldwide is developing, producing & marketing solutions in 3 main areas: Self-adhesive, Lamination and Coating.
The plant operates in three shifts in the policy of 24/7/365.
The plant managers wanted to implement a solution for collecting data from the production floor and processing it to an existing external BI system.
In contrast to conventional solutions, the management of the production floor, company managers have decided to implement the most advanced, but in the same time, proven cloud technology to enables them to be connected to the plant 24/7, including – and most important during the night shifts.
The factory engineers tested various technologies and finally chose RealiteQ as their technological solution.
The implementation of the system was carried out by the technicians of the plant and was accompanied by RealiteQ support engineers.

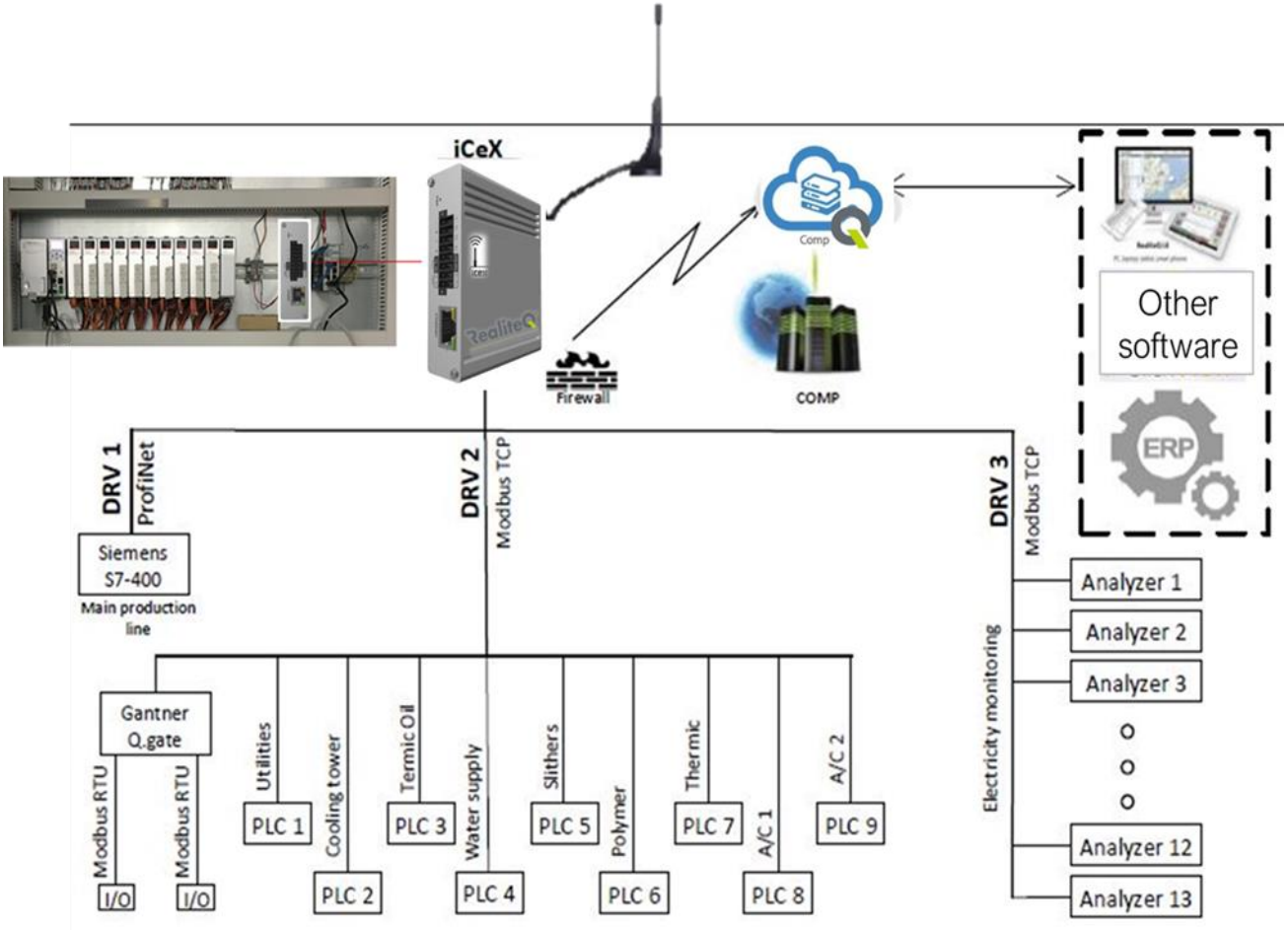
Solution description:

An iCex was installed in the factory, in which communication drivers were defined for the existing control and production networks.
For the main production line, a Profinet type of communication was defined for Siemens S7-400 Controller, which handles thousands of I / O on main production machines.
9 controllers for auxiliary systems have been configured for separate network communication via the Modbus TCP protocol. It is important to note that PLCs manufactured by different manufacturers are connected to this network and there is no uniformity in the equipment.
As part of this control network a Productivity 1000 controller manufactured by Automation Direct was also connected as well as a Q.pac dedicated controller from the Gantner Instruments, which itself manages an additional communications network of remote I/O units of various types in Modbus RTU serial communications.

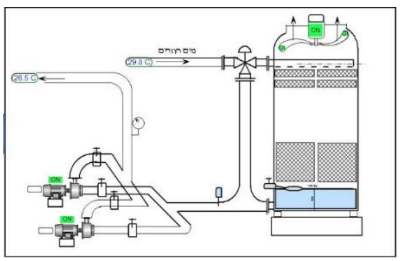
12 monitoring devices of the electricity grids in the various supply and consumption sectors are connected and defined in a third communications driver, and a monitoring of the electricity network data is performed.

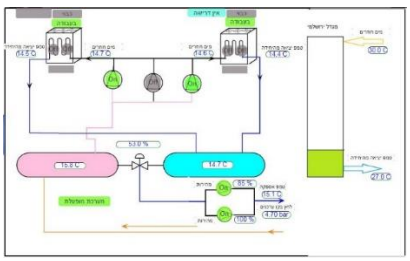


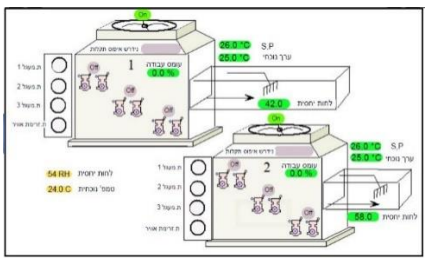
The iCex unit consolidates all the necessary data and collects all the requested parameters. RealiteQ portal in the cloud (COMP – Central Online Management Portal) handles the data and prepares them for transfer to the selected external BI system.



Using the RealiteQ system API, the data is drawn to the BI systems and to the ERP computers of the factory, and production reports and other analysis reports are produced (efficiency of machines, shifts, etc.).
In addition, the operation and maintenance personnel in the factory are accessible to the data of the various systems using mobile phone browsers or computers in the factory or in their home and are capable of handling events and malfunctions at any time and from any place.
In the event of faults in the production system or in the auxiliary systems, malfunction messages are sent to the parties handling the type of fault. Approval of a malfunction and examination of its causes are carried out in the event that the caregiver is outside the plant.

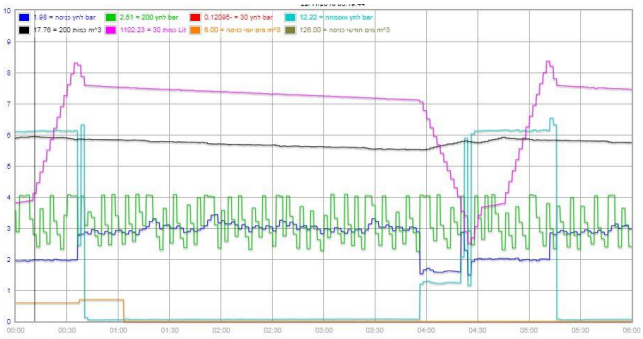


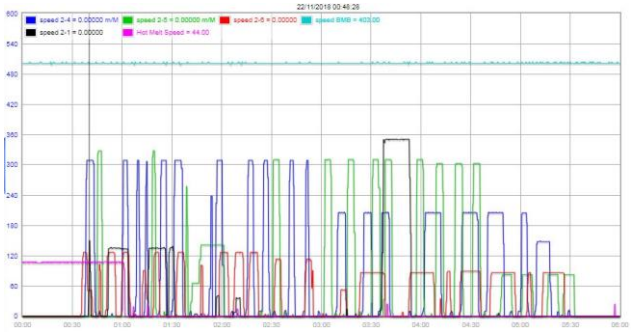




Results:

With RealiteQ today the managers, engineers and technical staff can see and gets alerts in real time 24/7 the entire system from any were any time using any device they have connected to the internet. They can see the operation screens, trend in graphs, reports such as active alerts and more.





value: Quality: **Unknown** Stamp: 05/03/2018 14:03:18
Current alarms : 2 active alarm

Path	Tagname	Description	State	Start	End
/nirotek02/alarms/alarm2012	התרעת לחץ מים קרים 15 למכונות	לחץ נמוך 15 מעלות למכונות	unacknowledged	02/11/2018 18:44:25	17/11/2018 19:00:06
/nirotek02/alarms/low prs 30 micron	לחץ מים 30 מיקרון	התרעת לחץ נמוך 30מיקרון	active	13/11/2018 14:54:05	

3. Energy and Gas

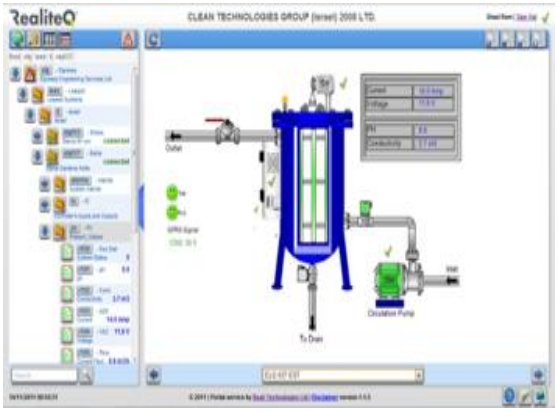
Case study 3.1: Increasing Energy Efficiency in Cooling Towers OEM (worldwide)

Background:

Cooling towers are large energy consumers common in many applications around the world. These facilities undergo a drop in energy efficiency over time, and the companies that service the cooling towers face a major challenge to improve energy efficiency and save energy in the regular operation of the cooling towers.

Project Description:

The energy efficiency challenge requires high capabilities and reliability in the real-time monitoring and control of complex systems. In order to meet the challenge, a number of different companies have contacted RealiteQ to provide the remote supervisory and control system on these systems, in order to enable regular remote maintenance of the systems, which will preserve a high level of energy efficiency.



4. RealiteQ provided the communications, the integration and the systems' operating screens. RealiteQ connected to controllers that operate systems for cleaning scale without the use of chemicals in cooling tower pipes, thus significantly reducing the electricity consumption in the cooling facility processes. In addition to controlling cleaning and washing actions, RealiteQ also provided data on the quality of water in the towers.

5. In this project, RealiteQ is effectively serving as an OEM supplier of the remote monitoring and control technology implemented in the scale-cleaning system supplied by the manufacturer to the cooling towers.

Unique Capabilities:

The distinction of the RealiteQ solution is that it provides maintenance personnel with the ability to remotely access the various systems deployed around the world. The systems are connected to various customers such as public institutions, industries, etc., with the internet connection achieved by various means (cellular and other). No outside software is used, and all activity takes place through the RealiteQ portal.

The system enables users to know in real time how much money was saved as a result of the energy savings achieved thanks to the cleaning actions

Summary and Results:

Today RealiteQ is OEM supplier for Various manufacturer of energy saving systems in cooling towers. Dozens of such systems installed around the world currently, using RealiteQ technology for remote system monitoring and control.

Case study 3.2: Virtual Power Plants (OEM - Germany)

Background:

German company is a virtual provider of energy that connects various generators throughout Germany to local power grids on the basis of designated contracts.

In order to operate these systems, the company needed real-time monitoring and control systems that enable it to send accurate data at predefined times (every minute, during the first ten seconds of the minute) to the purchasing electric company.

Project Description:

In 2007 RealiteQ was asked to provide a solution to German company, which at that time was entering the field of virtual power plants and sought an advanced system for real-time monitoring and control.

The hardware was installed on the various generators and the software interfaced with the generator's IO models, as well as through the RealiteQ portal and using RealiteQ OPC Server to provide data to their management software, which is connected to the power companies' centers to which the electricity was provided from the generators.

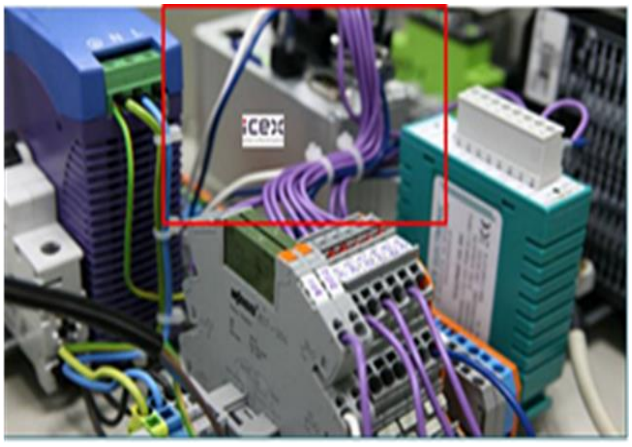
Unique Capabilities:

The distinction of RealiteQ solution was its interface with the generator systems via concurrent local and IO communications and at the same time connection to external management software via the OPC interface.

This project showcased RealiteQ ability to broadcast data in real time, reliably, consistently and with high determination and precision (always in the first 10 seconds of each operating minute) – from a number of different sites at the same time, and through various cellular providers.

Summary and Results:

The system has been operating successfully for a decade, and at its height handled dozens of sites at the same time, depending on how many contracts and active generators the company had.



Case study 3.3: SCADA and Security in Natural Gas Infrastructure (Israel)

Background:

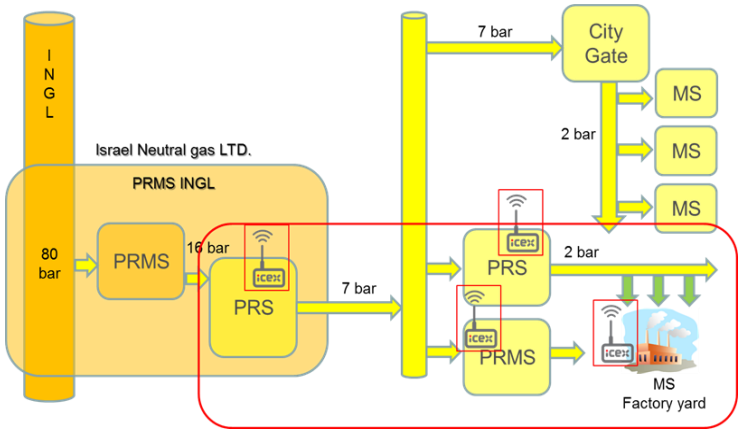
RealiteQ is a virtual ICT network that opens a reliable, redundant, safe, and secure event channel for real time remote control, monitoring and crisis management. It facilitates real time monitoring, control, and data acquisition from remote systems that are distributed at various locations and different networks worldwide.
The easy-to-install and user-friendly philosophy of the RealiteQ system have been applied to advanced control, so management and maintenance people can tackle large, interactive process problems. Users can now easily optimize their system for maximum throughput, maximum profit, and minimum energy.
Reali Technologies with its RealiteQ platform offers communication solutions for remote monitoring and control of oil & gas facilities.
Whether the process is drilling, refining, filtering, PRS, PRMS, city gate or other, RealiteQ is the perfect technology for remote control and monitoring.
With RealiteQ, you have a reliable and cost-effective solution for monitoring gas well production, pipeline flow, distribution system pressures and more…

Project description:

The gas flows through the national transmission system, and after an additional pressure reduction, it is transferred to the distribution companies.
The project extends across the north of the State of Israel.
As part of the project, the control, security, and SCADA systems are implemented in about 160 facilities in total.
About 10 facilities are PRS / PRMS or THT addition (for adding smell to the gas), while others are installed in factory yards or other large consumers facilities.

The components of the control panels at the various facilities include:
Programmed controller.
Flow corrector.
iCex (Integrated Cellular & Ethernet Explorer)
Security cameras
Perimeter fence sensing system
Power supply & backup batteries

It is important to note that the iCex component, as part of the RealiteQ system, makes communication to the cloud very stable, reliable, and secured.

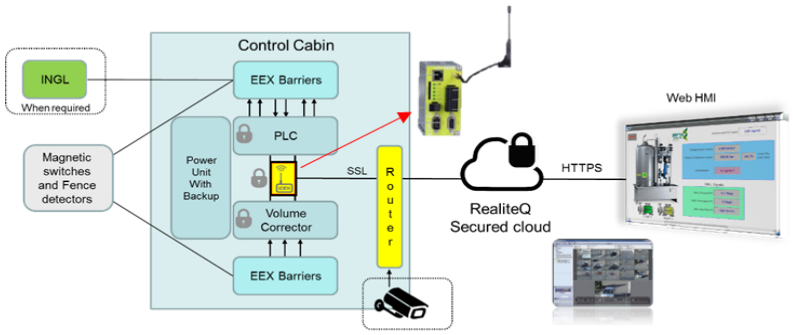


Workstations at the Control Center allow system operators remote control of all installations and sites.
The monitoring and measurement data of the gas supplied is routinely transferred to the national gas company through a secured channel for billing. In times of emergency, the gas supply can be stopped from the control center by typing a designated password and pressing the closing key of the dedicated facility where the event takes place.

In the definition of regulation, it was determined that renewing the supply of gas requires reaching the site, and only from this it is possible to carry out a process of resetting and opening the supply plant.

Unique Capabilities:

RealiteQ was chosen to provide the solution for real-time monitoring and remote control of Natural Gas distribution system in the north of Israel. The natural gas network is part of the national plan of moving the industry to use clean energy.
RealiteQ Platform was selected as for the combination of several unique



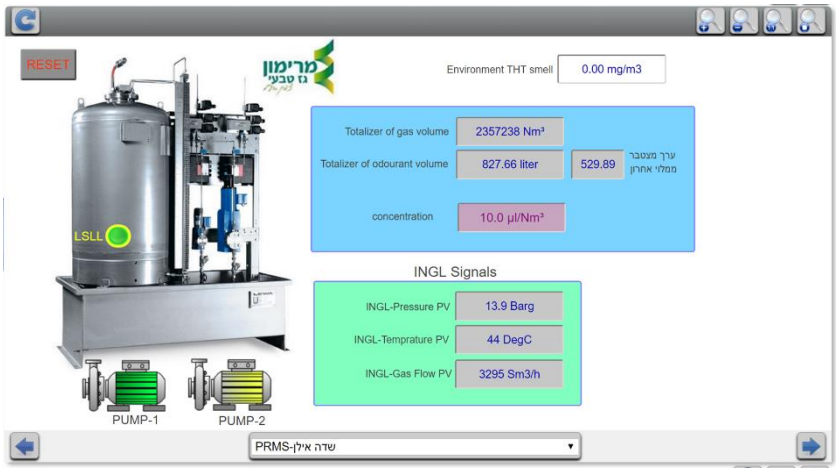
advantages:

- Most advanced End-to-End, Real-time cloud-based SCADA solution.
- High system reliability
- Secured web system
- Real time system which allows to monitor and remotely control (close valves) crises and other events.
- Technological flexibility, including the ability to communicate easily with different 3rd party technologies. Moreover, it's very competitive - cost together with the fast and simple installation makes RealiteQ the most cost-effective option in this case.
-

Summary and Results:

RealiteQ has enabled the customer to install facilities in an efficient, economical, and secured manner without the need to invest large sums in expensive communications and computer infrastructure.

Because RealiteQ is a modern and advanced cloud system, it enables the transmission company to develop at a pace that is suitable for market growth.
RealiteQ saves customers a lot of money and allows them to control their expenses on the one hand and provide their customers and regulation authorities with excellent service on the other.



Case study 3.4: Solar Energy fed Cellular Communication Base Stations (Cameroon, Africa)

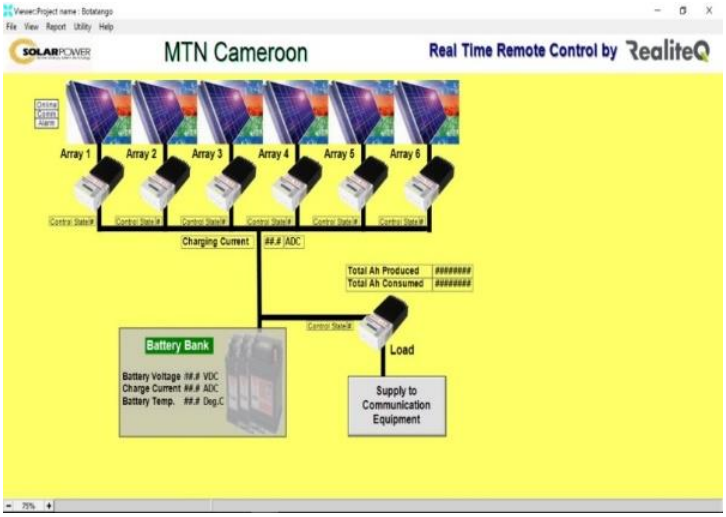
Background:

In Cameroon, Africa, the base stations for its cellular network are partially fed by solar energy systems, particularly in areas that are difficult to access.
In 2011 RealiteQ provided systems for remote monitoring and control of cellular systems to South African company MTN, which was also active in Cameroon.

Project Description:

The project included 7 stations throughout Cameroon. Each station is divided into a number of solar arrays, each such array being controlled by a separate designated charging controller, with up to 10 controllers per station.

Each of them was connected, for station management technical reasons, each controller defined as being independent on the network, although they were all served by a single iCex unit. In each iCex, separate ports and separate drivers were defined for each controller, each iCex serving five controllers. The iCex unit is used not just to coordinate communications, but also as a System gateway, with significant monetary savings in the initial investment.



Unique Capabilities:

The distinction of the RealiteQ solution is that it provides maintenance personnel with remote access to systems in out-of-the-way locations that are difficult to access physically. Each iCex unit has the ability to serve a number of controllers, and the iCex units serve both as a communications coordinator and as gateways. They work at high temperatures. Data is shared between network operators and the solar energy systems' maintenance companies. In addition to remote monitoring, the interface was also used for calibrating the system and changing parameters.

Summary and Results:

The system operated under extreme climate and physical conditions, at very distant sites that require complex technological capabilities, all with relatively low investment (CAPEX) and off-site service (SaaS – Software as a service) that completely relieved the cellular company of the issue of maintenance.

Case study 3.5: Energy Efficiency in Hotel (Bulgaria)

The challenge:

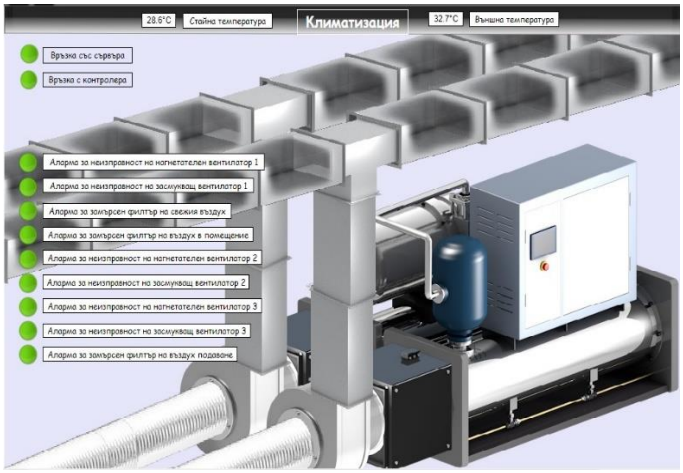
The ventilation system is taking 10 000 m3 of hot air from the kitchen and supply with 10 000 m3 fresh treated air from the AC group, when it`s working. The management of the hotel realize that the cookers start the ventilation early in the morning at 6 o`clock and stop it at night, around 23 or 24 o`clock. In general, the kitchen works around 8 hours, but the ventilation is working more than 17 hours. The ineffective ventilation system costs money of the hotel (energy, depreciation of the equipment…)

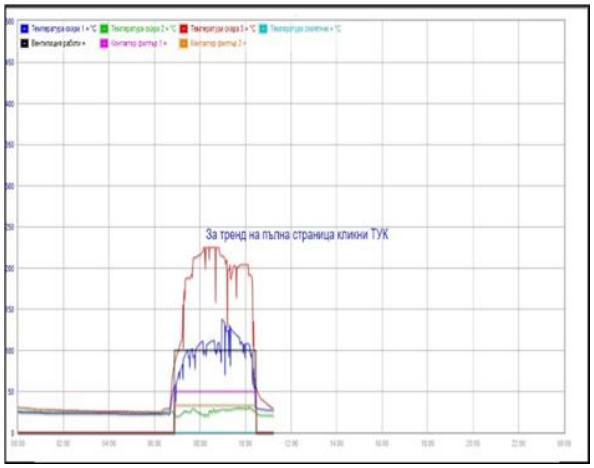
The scope of work:

RealiteQ - cloud base SCADA system, Automation direct - PLC, measurement instruments – Optris. The system Integrator built fully automated system, which measures the temperature of the hot points in the kitchen and starts the treating and the ventilation system only when it`s necessary. The result is 8 hours of working ventilation instead 17.

The solution:

The SCADA system of RealiteQ gives an important information of the temperature of the hot points in the trends, which helps for the improvement of the working regime of the kitchen.
RealiteQ is also connected to the ventilation & AC group, which gives data like regime of working, temperature, alarms and other important parameters.





The Results:

As for the high satisfaction of the customer from the results and from the capabilities of RealiteQ he asked to connect to RealiteQ also the pump for the rainwater system they have in the hotel.

3.6. Case Study: Centralized Monitoring and Control for Photovoltaic Electrical Plant

Introduction: Challenges in Remote Photovoltaic (PV) station Monitoring

Operating large, geographically dispersed Photovoltaic (PV) power plants presents significant challenges for remote monitoring and control. These facilities often cover vast areas, making physical inspection costly and slow.

Background (Optimizing Large-Scale PV Utility)

Bulgarian company Freya Engineering constructed a large **Photovoltaic (PV) electrical plant** near the city of Kresna, Bulgaria. The plant spans approximately 25,000 m² and feeds the generated electrical energy into the local power grid.

For the plant to achieve full and optimal operation, the client faced critical challenges related to real-time data acquisition and economic process control.

Key Operational Challenges:

1. **Real-Time Monitoring and Data Integrity:**
    - Required continuous, real-time monitoring of all power inverters, including generated power, critical alarms, and feedback on the generation coefficient of the photovoltaics.
    - The necessity for **accurate meteorological data** for performance optimization.
2. **Price-Based Control and Synchronization:**

- The system required accurate **time synchronization** based on the unit price set by the Independent Bulgarian Electrical Exchange (IBEX).
- Control was needed to prevent energy generation from becoming **counterproductive** when the price drops below a certain threshold.

Solution Overview: RealiteQ Cloud-Native SCADA

The Kresna plant adopted the RealiteQ Cloud-Native SCADA and IIoT solution, utilizing the **iCex** (Integrated Cellular and Ethernet eXplorer) device as an indispensable part of the project. This solution provides a centralized, real-time monitoring and control platform.

The iCex unit acts as a smart, dedicated gateway and Data Producer, ensuring stable data acquisition from the decentralized PV field by communicating directly with the local PLCs and inverters. **This directly addresses the challenge of Bundling of Small Systems by unifying data from all decentralized components into a single platform.**

Operational Capabilities and Results

The RealiteQ platform delivered full real time command and control over the plant's assets, achieving both operational excellence and economic efficiency.

A. Real-Time Data Acquisition and Synchronization

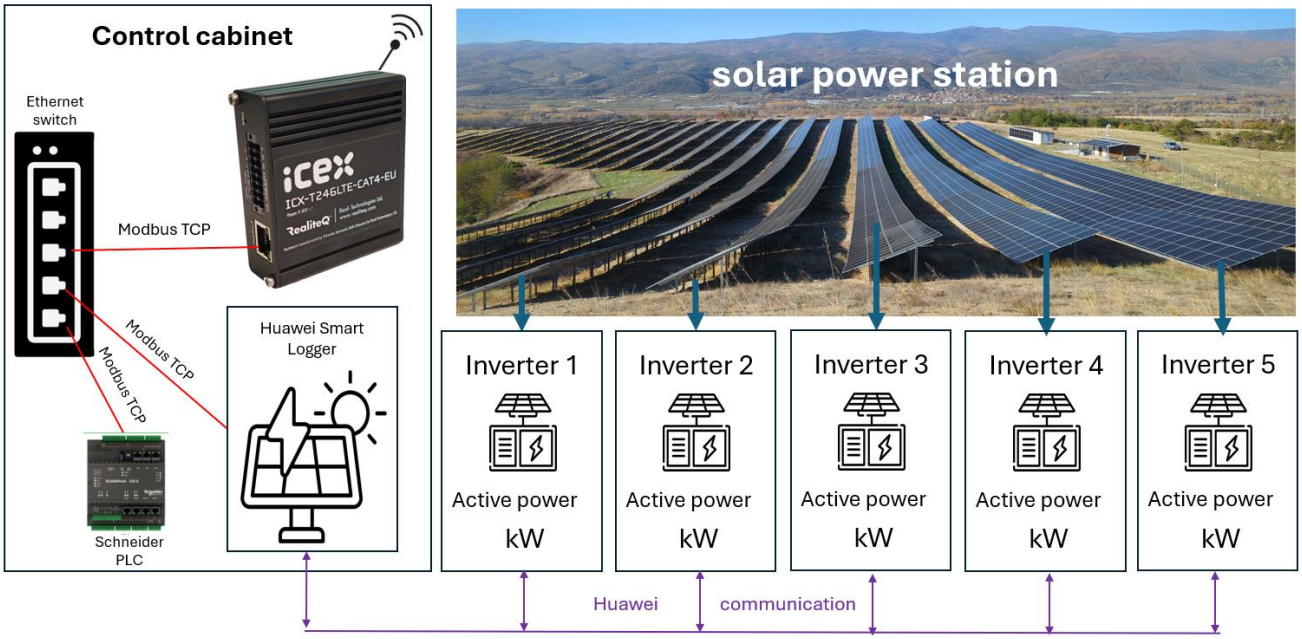
- **Alarm and Status Monitoring:** RealiteQ is versatile enough to both monitor an inverter's current status and read the PLC's registers.
- **High-Speed Notification:** The cloud service allows monitoring of a large number of alarm addresses at a sample rate of **less than 20 seconds**, which is sufficient for the project's requirements.
- **Data Presentation & Optimization:** The centralized platform unifies all data from all dispersed facilities into a single operational interface. **This provides the clear, actionable insights required for optimization and efficient decision-making.**

B. Remote Control and Automation

- **Direct Control via Digital Outputs:** A critical control issue was solved by utilizing the iCex's built in **digital outputs** to send a control signal to a PLC governing specific electro-mechanical components. **This capability is key to enabling the rapid, Price-Based Control required.**
- **Operational Autonomy:** Information for the current status of the plant is sent at a stable rate. Direct control commands can be sent back from the cloud, effectively making **direct human intervention not necessary for the most part of operation and time**.

C. Communication Reliability and Resilience

- **Communication Redundancy:** iCex provides stable communication with COMP – RealiteQ software in the cloud. It has 2 slots for SIM cards. It connects to RealiteQ software in the cloud via factory LAN. This way it supports redundancy between LAN and cellular connection as backup.



Conclusion: Overcoming Operational and Economic Barriers

The implementation of RealiteQ's solution at the Kresna PV Electrical Plant directly addressed all core challenges of remote PV monitoring.

The system successfully achieved **Bundling of Small Systems** by using the iCex as an intelligent edge device that unified data from all inverters and PLCs into a single, comprehensive platform, facilitating **Data Presentation and Optimization**. The device guaranteed a **stable, redundant communication path** (mobile data and Ethernet), which was vital for **Operational Continuity** and overcoming the challenges of **Communication Reliability** typical for remote locations.

Most significantly, the Cloud-Native SCADA platform enabled the critical, **price-sensitive control** required: by leveraging high-speed data acquisition and the ability to send direct control signals, the plant achieved **optimal energy production synchronized with IBEX market prices**, ensuring maximum return on investment and high operational autonomy.

4. Building Management System (BMS)

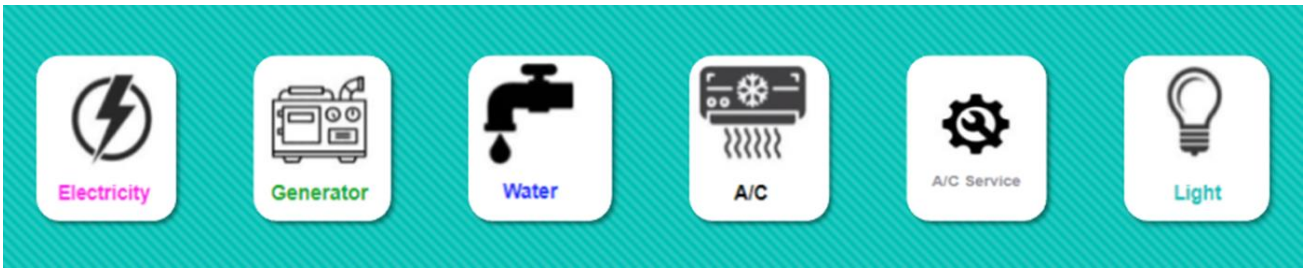
4.1.Case study 4.1: Building Management Systems - BMS (Israel)

The Challenge:

Building Management Systems (BMS) involve integrated services by multiple vendors for electricity, water supply, EC, access control, fire alarms and more, which makes it extremely challenging to provide reliable and secured real-time network visualization and remote control of the different systems.

The Project:

Connecting all systems of the office building in one operation & data management system to provide 24/7 real time remote monitoring and control of basic building parameters and achieve savings of energy and water.



RealiteQ Unique capabilities:

RealiteQ IIOT & Cloud computing holistic solution was chosen for this project for following reasons:

- Agnostic – seamless interfacing in parallel with multiple vendors of equipment
- Modularity – the project can be bult in stages, connecting the systems one by one, without affecting back already connected and running systems.
- Scalability – this solution can be duplicate using one centralizing system for all the budlings managed by the company.
- OT – IT convergence (including remote control, analytics, alert management...)
- Reliability, safety and cybersecurity
- Fast, simple installation

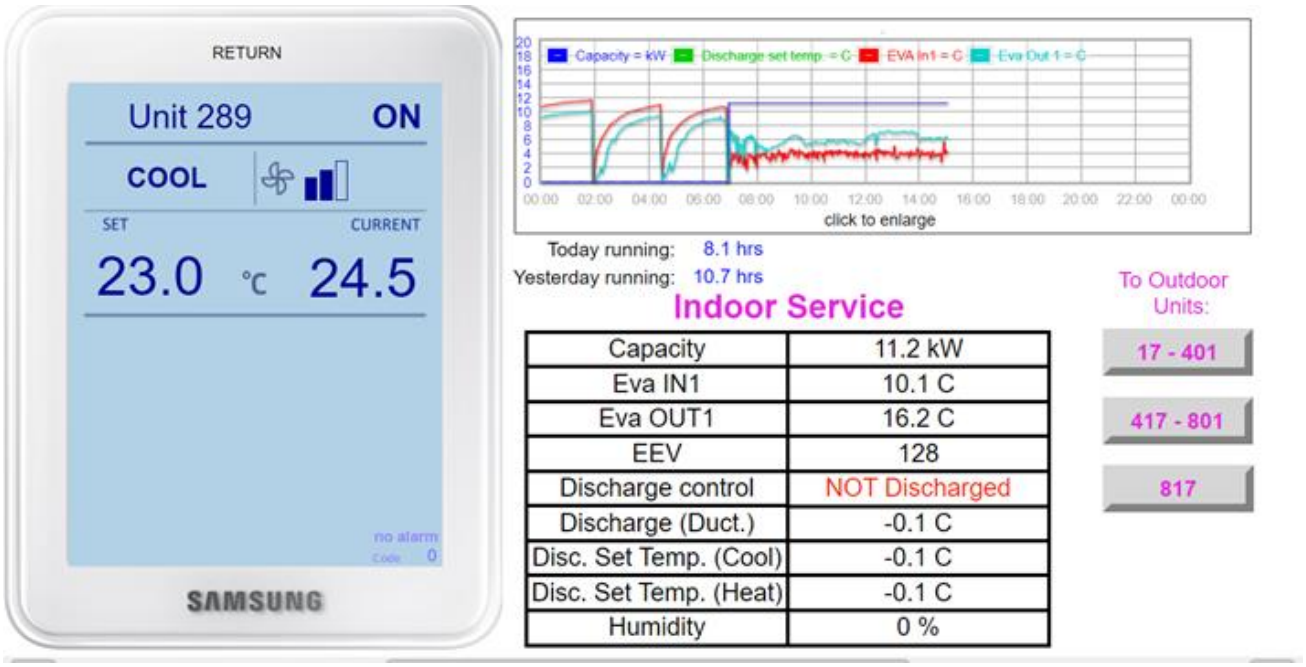
Smart alert & notification system

A/C challenge:

At the first stage basic parameters of A/C systems in all 51 office rooms of the building were connected to RealiteQ. User's main display shows basic parameters in each room, like:

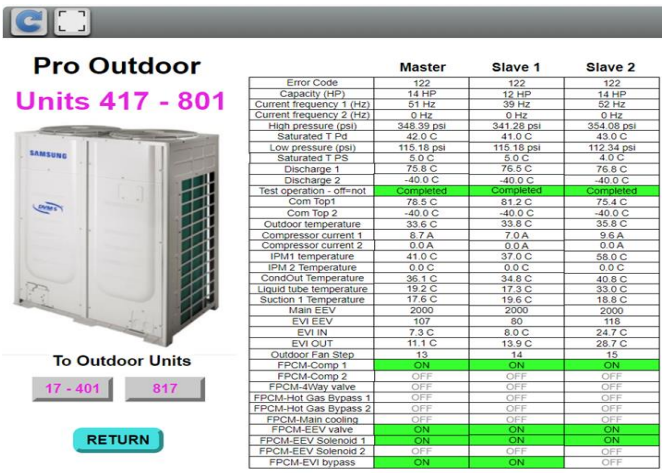
- A/C on/off
- Preset and current temperature
- Filter clean alarm and
- General alarm

Click/touch on specific room rectangle leads to its specific display with more details.
Design of "room A/C operating panel" in RealiteQ display is like A/C operating touch panel in each room, which make user interface very friendly. RealiteQ room A/C display shows also working hours for current and previous day, as well of temperature changes trends. As well as service parameters of each room's indoor unit, as well as relevant parameters of outdoor units.



In room's A/C service display, which is served the technical maintenance team, in addition to main information, there are practically all parameters of indoor unit, as well as trends of important of them. This information will let maintenance team to improve operation, save energy and shorten repair time.

There are also parameters of outdoor units.



	Master	Slave 1	Slave 2
Error Code	122	122	122
Capacity (HP)	14 HP	12 HP	14 HP
Current frequency 1 (Hz)	51 Hz	39 Hz	52 Hz
Current frequency 2 (Hz)	0 Hz	0 Hz	0 Hz
High pressure (psi)	348.39 psi	341.28 psi	354.08 psi
Saturated T Pd	42.0 C	41.0 C	43.0 C
Low pressure (psi)	115.18 psi	115.18 psi	112.34 psi
Saturated T PS	5.0 C	5.0 C	4.0 C
Discharge 1	75.8 C	76.5 C	76.8 C
Discharge 2	-40.0 C	-40.0 C	-40.0 C
Test operation - off=not	Completed	Completed	Completed
Com Top1	78.5 C	81.2 C	75.4 C
Com Top 2	-40.0 C	-40.0 C	-40.0 C
Outdoor temperature	33.6 C	33.8 C	35.8 C
Compressor current 1	8.7 A	7.0 A	9.6 A
Compressor current 2	0.0 A	0.0 A	0.0 A
IPM1 temperature	41.0 C	37.0 C	58.0 C
IPM 2 Temperature	0.0 C	0.0 C	0.0 C
CondOut Temperature	36.1 C	34.8 C	40.8 C
Liquid tube temperature	19.2 C	17.3 C	33.0 C
Suction 1 Temperature	17.6 C	19.6 C	18.8 C
Main EEV	2000	2000	2000
EVI EEV	107	80	118
EVI IN	7.3 C	8.0 C	24.7 C
EVI OUT	11.1 C	13.9 C	28.7 C
Outdoor Fan Step	13	14	15
FPCM-Comp 1	ON	ON	ON
FPCM-Comp 2	OFF	OFF	OFF
FPCM-4Way valve	OFF	OFF	OFF
FPCM-Hot Gas Bypass 1	OFF	OFF	OFF
FPCM-Hot Gas Bypass 2	OFF	OFF	OFF
FPCM-Main cooling	OFF	OFF	OFF
FPCM-EEV valve	ON	ON	ON
FPCM-EEV Solenoid 1	ON	ON	ON
FPCM-EEV Solenoid 2	OFF	OFF	OFF
FPCM-EVI bypass	ON	ON	OFF

Case 4.2: Pharma Logistic Center - Bulgaria

RealiteQ Implementation in Pharma Logistics Center

Background

Kaliman Pharma Logistics Center is one of Bulgaria's largest pharmaceutical **distribution hubs, comprising three warehouses — two in Sofia and one in** Slivnitsa: All 3 warehouses are connected to RealiteQ under one project, performed by Bulgarian company Freya Engineering. The facilities handle a wide range of pharmaceutical products, from common medications such as Aspirin to highly regulated narcotics, demanding strict environmental, safety, and security controls.

Client Requirements

The client required the system to comply with **TAPA FSR Class A** — the highest global standard for logistics facility security, ensuring protection for high-value and sensitive cargo. In addition, RealiteQ was expected to support **ISO 9001** quality integration and manage a variety of operational, safety, and environmental systems across all sites.

Solution Overview

Reali Technologies implemented the RealiteQ cloud-based SCADA and IIoT solution, providing a centralized, real-time monitoring and control platform covering all aspects of warehouse operation — from climate regulation to energy generation and security systems.

Key functional areas included:

- **Environmental Control:**
  Each room was equipped with three temperature and three humidity sensors. RealiteQ continuously monitors these devices, records deviations, and automatically notifies responsible personnel according to predefined escalation procedures. In case of equipment failure, the system triggers backup units and alerts service engineers.

- **Automated Reporting:**
  RealiteQ generates detailed daily and weekly reports automatically, summarizing environmental conditions, deviation durations, causes, and corrective actions — ensuring full traceability and regulatory compliance.

- **Renewable Energy Management:**
  The platform integrates photovoltaic (PV) systems from all three warehouses, providing real-time data for performance optimization and energy efficiency analysis.
- **Automated Warehouse and Robotics Systems:**
  Two warehouses operate robotic systems for logistics automation. RealiteQ enables unified monitoring and traceability of all robotic operations within the central control environment.
- **Fire Safety and Sprinkler Control:**
  The system was configured to meet BDS EN12845 and NFPA 13 (2019) standards for ESFR K-320 sprinkler systems. RealiteQ incorporated a double-validation scenario to prevent false fire activations — a critical safeguard given the high value and sensitivity of pharmaceutical goods.
- **Access Control and Security Integration:**
  RealiteQ integrated with the site's access control system to track service personnel movement in real time, ensuring full compliance with TAPA's physical and procedural security requirements.
- **Backup Power Monitoring:**
  Weekly diesel generator tests are automatically initiated and monitored, with notifications sent to engineers and service providers if anomalies are detected.
- **Energy and Electrical Systems Supervision:**
  Real-time monitoring covers all electrical circuits, including lighting, HVAC, power meters, capacitor banks, and surge protection systems. Even EV charging stations are integrated, enabling detailed energy consumption tracking per vehicle.

Results and Benefits

- **Full compliance with TAPA FSR Class A security and ISO 9001 quality management standards.**
- **Centralized, real-time visibility across all warehouse operations.**
- **Enhanced operational resilience and preventive maintenance through automated alerts and redundancy management.**
- **Improved energy efficiency and sustainability via integrated PV monitoring and optimization.**
- **Increased safety and reduced risk of false alarms in fire suppression systems.**
- **Strengthened accountability and traceability for all staff activities and system operations.**

Conclusion

The implementation of RealiteQ at Kaliman Pharma Logistics Center transformed the facility into a fully connected, smart logistics hub. By unifying environmental, security, and operational management under one scalable cloud-based platform, RealiteQ delivered both regulatory compliance and operational excellence for one of the most demanding sectors — pharmaceutical logistics.

Case 4.3: Energy efficiency in Supermarkets – Bulgaria

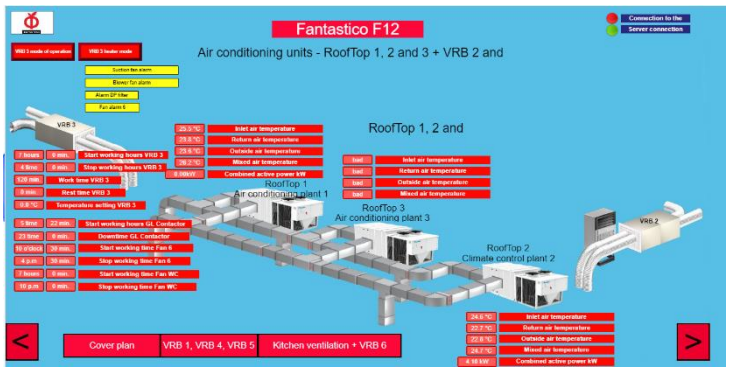
Introduction

Supermarkets today face growing pressure to operate more efficiently and sustainably. With rising utility costs and increasing demand for environmentally conscious business practices, reducing energy consumption, water usage, and operational expenses has become a critical goal for retail chains. However, achieving these efficiencies is often a complex challenge, given the wide variety of interconnected systems—from lighting and refrigeration to HVAC and food preparation. This case study explores how Fantastico, a supermarket chain in Bulgaria, tackled these challenges head-on through an innovative technological approach.

The challenge

Fantastico is Bulgarian supermarket chain, currently operating 45 stores, mostly in Sofia, but also in some other cities across Bulgaria. The management of the chain was searching for ways to improve the efficiency of different systems in the store.

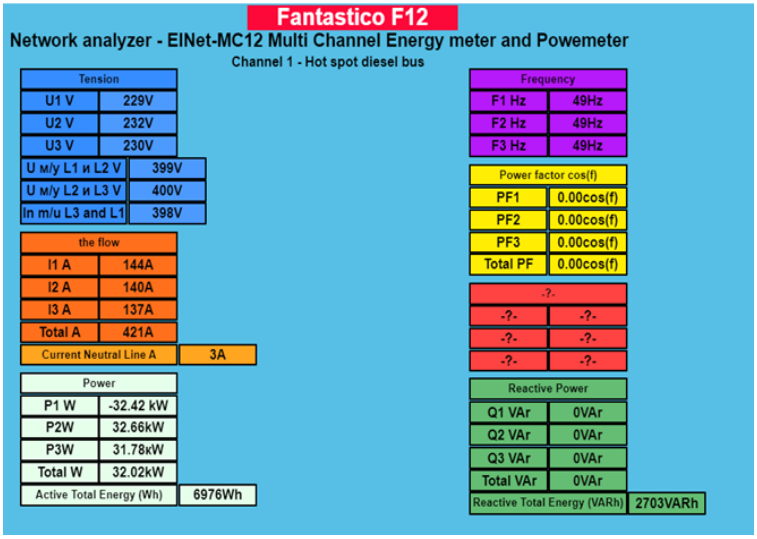
Scope of work



Bulgarian engineering company Freya was selected to connect all systems – energy, HVAC, water flow, lighting and kitchen in Fantastico supermarket in Mladost 4 neighborhood in Sofia in a pilot project. RealiteQ 4th generation SCADA was chosen for this pilot project. All existing systems in the store were connected in a network to one iCex. This provided real time monitoring and control of energy, HVAC, lighting, water and kitchen. The data was presented in clear, attractive and user-friendly dashboards and reports. Management

and maintenance technicians got access to the data 24/7 on their devices – computers, laptops, tablets and smartphones.

Result



Monitoring and advanced control of all systems in the supermarket resulted to sensitive savings in energy and water. Online and historical data, provided by RealiteQ, let Freya and management of the store to improve the operation of the systems. Using RealiteQ advanced Users' permission management and alarming, access to specific systems, and only limited to specific systems was given to the suppliers and maintenance companies related to the store. They not only received alarms from their systems in real time but also were able to monitor remotely and find the reason for the problem. This shortened drastically the time to perform the maintenance procedures from usually 2-3 days to about 2-3 hours. In some cases, analyzing the real time values and historical reports led to predictive maintenance operations.

5. Agriculture

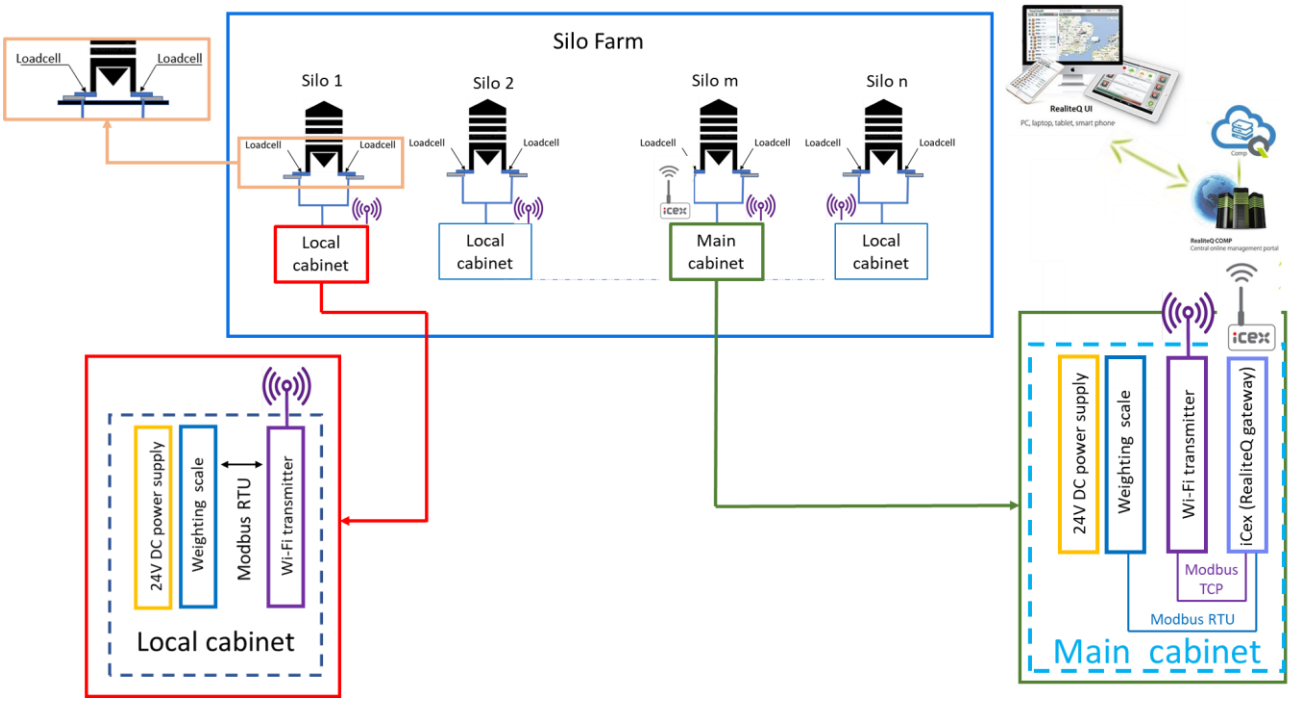
Case study 5.1: Poultry Distributed Silos Real Time Remote Monitoring & Control (Israel)

Background & the Challenge:

Company, producing animals' food, through one of its subsidiaries, is one of the major poultry growers in Israel. Distributed all over the country, the company needs to monitor the amount of food in every farm and silo (tank). The data must be transferred to ERP so production can be plan exactly according to real needs and not according to estimations. moreover, well planned production is more efficient and eliminate emergency actions to react missing of food in remote farms.

In addition to the monitoring of total amount of food in each farm there is a need to monitor daily consumption of food for each one of the houses. That enables full control on used food and prevent logistic drawbacks.

Project architecture:

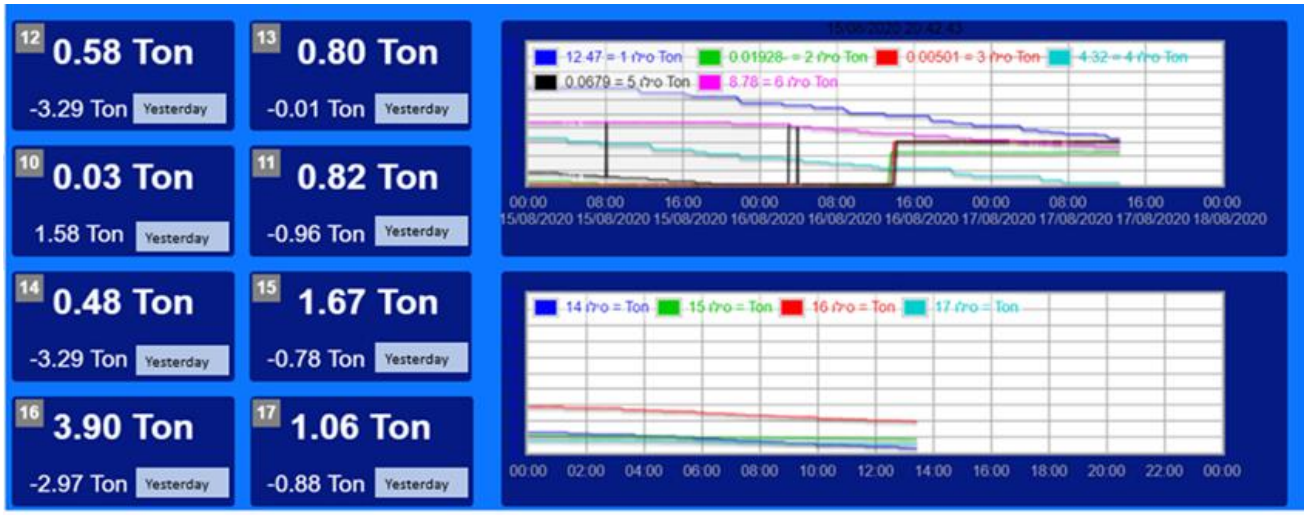


Project Description:

In 2019, the project began with a single farm in the center of Israel. The farm has 6 houses, each one of them with 2 Silos (tanks). On every house installed a small cabinet with electronic weighing unit. Due to the large

geographical area of the farm, the local communication network among the houses done by Wi-Fi and in every cabinet a Wi-Fi adapter has been installed. RealiteQ ICEX unit was installed inside the first (main) cabinet. The communication between of iCex to the local network is done over Modbus RTU while as mentioned before, all weighing units are networked over Wi-Fi.

The system enables data to be seen by local farm grower, regional managers and in parallel the data is transmitted to the ERP and production systems of the company.



Unique Capabilities:

The system uses cellular connection to transfer data to the cloud and a mix of serial and Wi-Fi communication for local networking inside the farm.

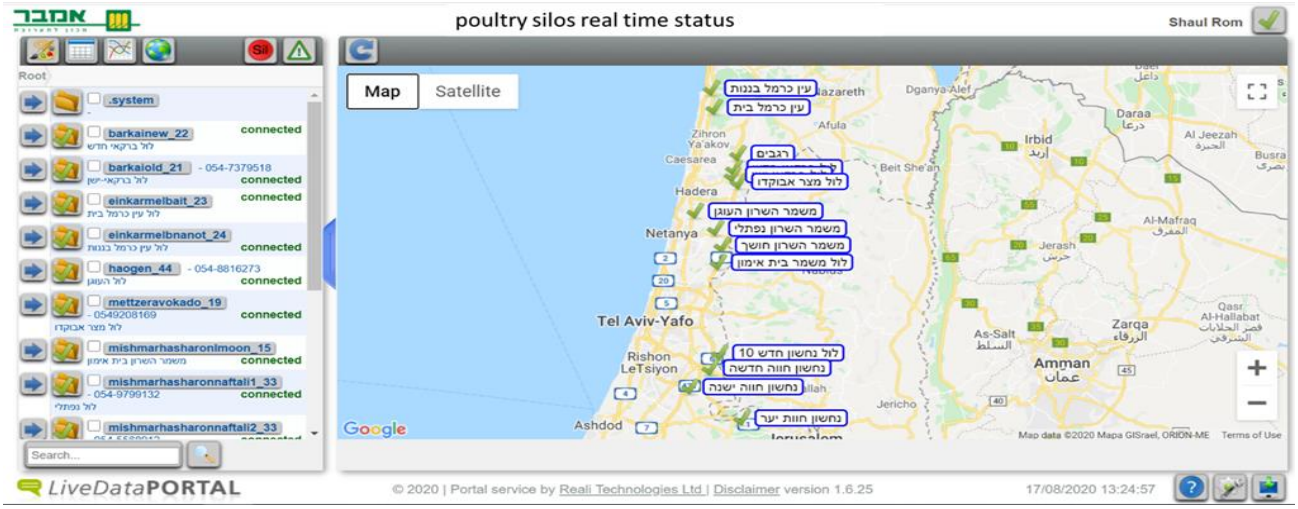
The solution not only sends data to ERP and central production systems, it also makes maintenance simple by enabling secured remote access for the calibration of all weighing units from time to time as required.

In addition, advanced RealiteQ BI/AI functions has been used to present the grower and managers real time information of food consumption, and also for monitoring the health of the house/farm as low food and water consumption is a result of illness.

Date	Silo 14	Silo 15	Silo 16	Silo 17
17/08/2020 13:25:00	0.48 Ton	1.68 Ton	3.90 Ton	1.06 Ton
17/08/2020 13:20:00	0.48 Ton	1.68 Ton	3.90 Ton	1.06 Ton
17/08/2020 13:15:00	0.50 Ton	1.68 Ton	3.97 Ton	1.08 Ton
17/08/2020 13:10:00	0.51 Ton	1.68 Ton	3.97 Ton	1.08 Ton
17/08/2020 13:05:00	0.52 Ton	1.69 Ton	3.97 Ton	1.08 Ton
17/08/2020 13:00:00	0.53 Ton	1.69 Ton	3.97 Ton	1.08 Ton
17/08/2020 12:55:00	0.53 Ton	1.69 Ton	4.00 Ton	1.09 Ton
17/08/2020 12:50:00	0.57 Ton	1.70 Ton	4.01 Ton	1.09 Ton
17/08/2020 12:45:00	0.71 Ton	1.73 Ton	4.01 Ton	1.09 Ton
17/08/2020 12:40:00	0.71 Ton	1.73 Ton	4.01 Ton	1.09 Ton
17/08/2020 12:35:00	0.71 Ton	1.73 Ton	4.01 Ton	1.09 Ton
17/08/2020 12:30:00	0.72 Ton	1.73 Ton	4.01 Ton	1.09 Ton
17/08/2020 12:25:00	0.71 Ton	1.73 Ton	4.01 Ton	1.09 Ton
17/08/2020 12:20:00	0.71 Ton	1.73 Ton	4.01 Ton	1.09 Ton
17/08/2020 12:15:00	0.71 Ton	1.73 Ton	4.01 Ton	1.09 Ton
17/08/2020 12:10:00	0.71 Ton	1.73 Ton	4.02 Ton	1.09 Ton
17/08/2020 12:05:00	0.73 Ton	1.73 Ton	4.02 Ton	1.09 Ton
17/08/2020 12:00:00	0.73 Ton	1.73 Ton	4.02 Ton	1.09 Ton
17/08/2020 11:55:00	0.73 Ton	1.73 Ton	4.02 Ton	1.09 Ton
17/08/2020 11:50:00	0.73 Ton	1.73 Ton	4.02 Ton	1.09 Ton

Summary and Results:

Immediately after RealiteQ's installation on the first farm, it was understood that this solution is a must for all farms. Production is more precise now, grower has better understanding of the situation in the farms, managing and controlling food supply has been proofed and managers have all the information evaluable from their smartphone wherever they are. RealiteQ helps the producer to be better managed, more efficient, more secure and a more successful.

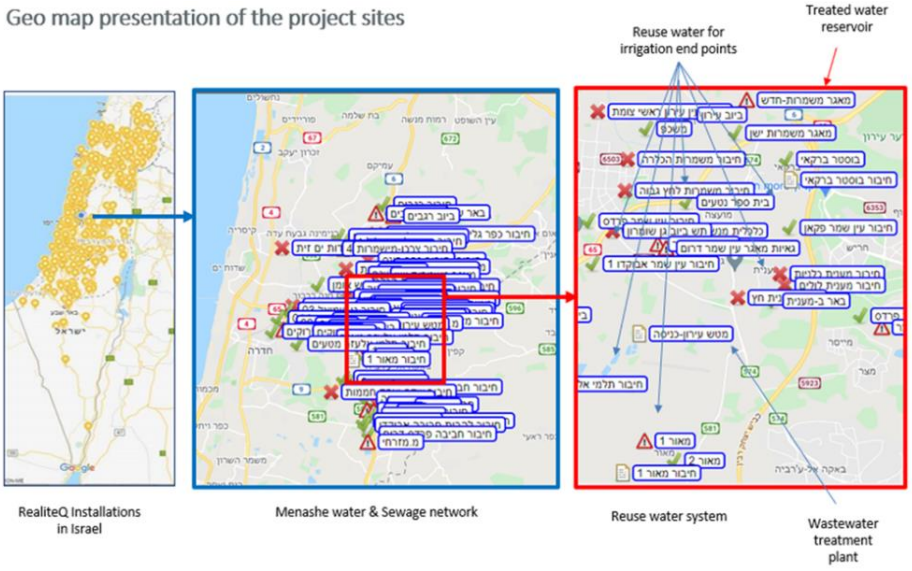


Case study 5.2: End-to-end wastewater recycling system for irrigation (Israel)

Background

The Project was done by a regional council which has set itself a goal Preserve and promote the environmental activity in its territory. The council established an impressive water recovery plant that provide millions of cubic meters of treated water for agriculture irrigation.

The Menashe Regional Council was established in 1950, its area covers 160 million square meters. The council consists of 24 settlements with different settlement characteristics, each of which has an independent water and sewage system under the roof of the regional council, in the territory of the council there are many agricultural areas that are owned by the various settlements, and a wide variety of water and sewage facilities scattered throughout the area. The distributed water and sewage system includes all the facilities from water storage, water treatment, water supply and, as mentioned above, wastewater and its treatment.



The challenge:

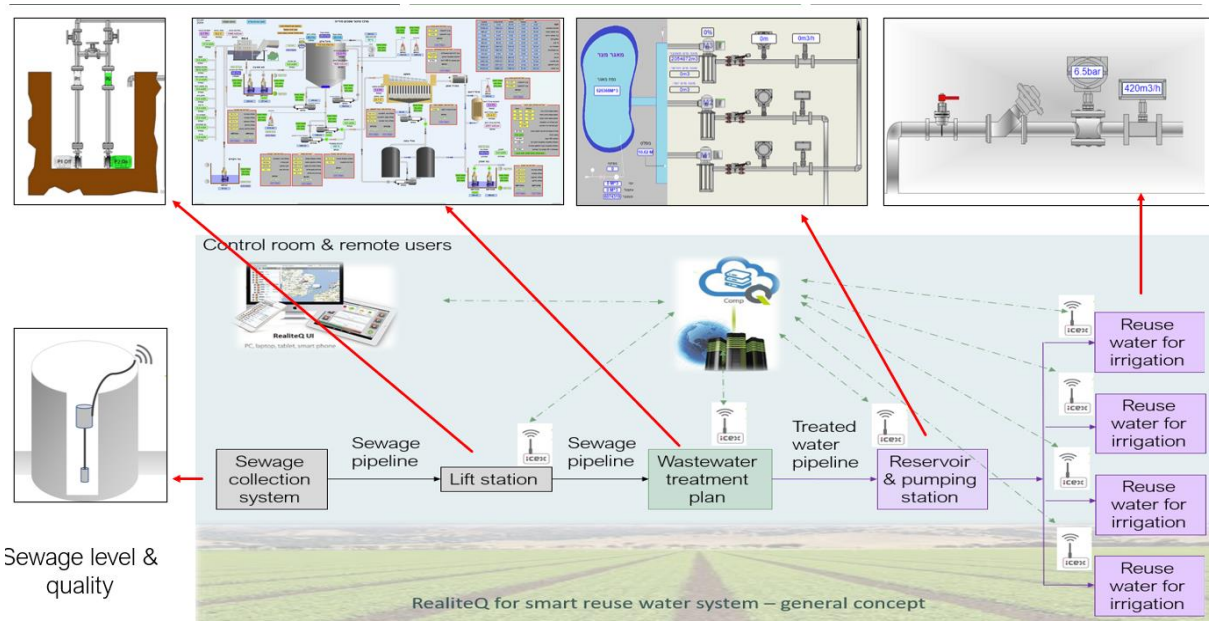
Such an arrangement creates a great challenge both in the supply of water to the various settlements as well as to the agricultural areas, and even more so, the collection of sewage water from the various settlements for one system, treating the wastewater and returning it to the farmers for irrigation. The system is spread on a large area from the collection area and up to the reuse/disposal area of the treated water. This area is changing in most cases from urban area to a rural area, with long distance between the different site and facilities and in many cases with a challenging topography change between the different sites.

So, the main challenges in the project were:

- The system is made of many different components providing a huge amount of data (flow, discharge, water level, water quality…) which are all relevant for safe and efficient operation.
- A large variety of facilities from underground manhole to pumpstations, reservoirs, and up to complicated Wastewater treatment plan.
- A large variety of equipment (Sensors, PLC, analyzers, pumps, valves…), manufactured by different manufacturer and using different communication protocols.
- In the system combined real time devices for monitoring and control together with data loggers for monitoring which are not real time.
- Large number of users from different disciplines (Technicians, operators, local managers, senior managers, professional experts…) located in different places (on site level, utility level, municipality level…), who needs different data in different

The Solution:

- The entire remote control and data management of this project is done by RealiteQ.
- In this project the treated wastewater is distributed to 30 remote sites and used to irrigate the agriculture fields.
- The project control by RealiteQ includes all the facilities in the system (WWTP, Lift stations, Pumping stations, reservoirs, busters, distribution network, farmers…).



RealiteQ for smart reuse water system – general concept

Main facilities and required data:

1. Wastewater treatment plant

The system monitors and control all the process of treating the wastewater, from the entry point to the plant and up to the point where the treated water (as well as the waste) leave the plant.

2. Reservoir and pumping stations

Direct communication and Data sharing between the reservoir and the Pumping station (some time they can be in the same site but in other case they can be in separated sites as well. In this case, direct communication system and data sharing can prevent overflow events at the reservoir and manage critical events.

3. Lift station

In the lift station it is common to monitor and control the operation, maintenance, collections, and more... Usually control local PLC (if exist) and sensors as required providing real-time and historian data, trends, reports, notifications, and alerts.

4. Recycled water for irrigation entrance point

When dealing with wastewater recycling system for irrigation it is important to connect to the centralizes system also the entrance point to the irrigated area. This way you can know exactly the amount of recycling water provided to the end user (for billing), but also to manage the entire distribution of the treated water to avoid overflow at the reservoir and overloaded on the treated plans.

The Results:

Today, most of the water and wastewater facilities are already connected to RealiteQ and working very well in the most efficient and safe mode. Data is collected and analyzed with in RealiteQ system allowing better collaboration, coordination, and data sharing among all the settlements and the farmer and the council territory, but moreover RealiteQ improve the corporate governance of the regional council as well as of each of the settlements in the region.

Case study 5.3: Palm Tree Fields Irrigation (Gabon, Africa)

Background

Israeli company, world leader in irrigation technologies, is building project for undersurface irrigation of large Olam Palm trees fields in Gabon, Africa.

Project description

System consists of 14 irrigation rooms - 9 rooms with 1 Mainline and 1 Fertility and 5 rooms with 2 Mainlines and 2 Fertility. Each fertility provides same fertilizer from 4 tanks to meet required flow and acid from 1 tank. Each Head control (HC) station contains a main valve, main water meter, fertility booster pump and 5 dosing channels with 5 dosing-meters. At each irrigation room there are 2 pressure sensors plus 1 Pressure sensor at the entrance. All irrigation valves are operated by RadioNet system.

Unique capabilities

RealiteQ, connected to all 14 HC, provides dashboards about the status of whole system. From Main display operators (RealiteQ users) can drill down to specific HC and pumping station and monitor their status, providing reports in trends and tables. Alarms are provided by RealiteQ too.

In this project RealiteQ provides information about:

- Alerts
- Reports
- Hydraulic information such as:
    - Pressure
    - Flow (for main line and for dosing system)
    - Irrigation status (Active/Inactive)
    - Main Valve Open/Closed
    - Irrigation Valves status Open/Closed/Faulty/Pending
    - Sensors' information.
    - Dosing valve status Open/Closed
    - Dosing Booster status – On/Off/Faulty

RealiteQ also eliminates the need for building complicated communication infrastructure, expensive servers, and IT support personnel.

Summary and results

The new irrigation system provides sensitively better grow of palm trees and drastically increases the quantity of palm oil, produced from irrigated fields.

Dashboards, graphs, and reports, provided by RealiteQ enable real time control of the system. Historical data helps to improve the irrigation process, while saving water and energy.

Case study 5.4: Remote Supervision & Control of Irrigation Machines (Israel, OEM)

Background:

Agricultural company in Israel has a large number of linear/pivot irrigation machines, distributed over extensive areas, differing and distant from each other.

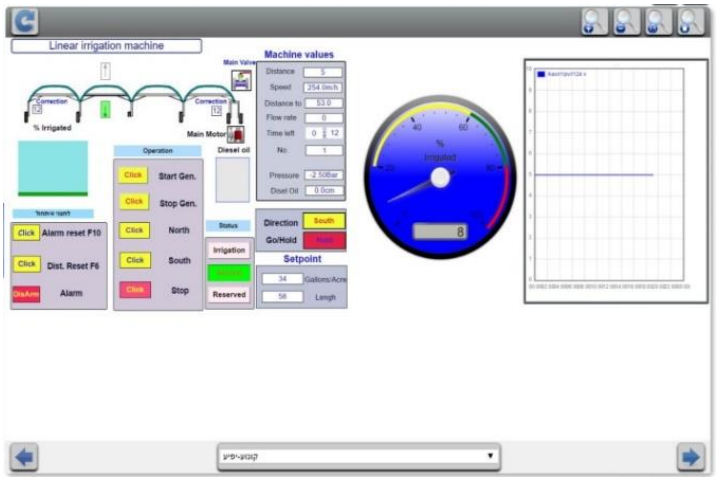
The irrigation machines move in a linear or circular manner at slow speeds and irrigate the fields they pass over. As they are machines in every sense, they are powered by a diesel engine or an electrical motor, and feature various controls for speed, direction, motor management and securities/protections, both for the motor and for the sprinkling and irrigation systems. Each of these requires appropriate control, and as the machine is in constant motion – it needs to be operated wirelessly.

Project Description:

In 2014, the project began with a single irrigation machine for the customer, and the irrigation machine selected for this purpose was the one located at the greatest distance from the company producer. An iCex unit was installed on the linear irrigation machine, connected to the irrigation machine's controller, and it sends all of the information both to its operators and directly to the remote units controlling the supply of water and pressure to feed the irrigation machine (multi-directional communications).

Unique Capabilities:

The distinction of RealiteQ's solution is the cellular communication capability, which enables different irrigation machines to be connected without the need to deploy a radio infrastructure. Another special capability of the system installed is that of its multi-directional communication, which enables the irrigation machine's controller to communicate directly, and concurrently with the water supply system and with the operators.



Summary and Results:

Immediately after RealiteQ's installation on the first irrigation machine, it was understood that this was a good way to monitor and control everything taking place in and around the irrigation machine.

As the machine operates and moves independently, it's very important and relaxing to see from afar, at any given moment, where it is and what its status is. This system in effect precluded the need for any wired connection, which is no longer unnecessary and had caused many problems in the past.

The system enables real-time control over the rate of progress and the amount of water needed, and of course issues an immediate alert regarding any problem or incident.

In light of the success and the customer's satisfaction, one season later, three additional irrigation machines were upgraded the same way, using a RealiteQ system.

Case study 5.5: Remote Monitoring and Operation of Fish Farming Ponds (Israel)

Background:

In 2010, RealiteQ was asked to provide a comprehensive and central solution for the remote monitoring and operation of all essential systems, including oxygenating the fish feeders, and all the other essential elements for optimal fish farming in one of Israeli's kibbutz fish ponds.

Requirements:

For optimal fish farming, real-time data from the fish ponds that are spread over a large and remote area must be available. The data must be coordinated at the level of local and wireless control for short distances of about 200 to 300 meters, all of which must be combined in a data coordinator that creates an active control center (remote) for all the parameters.

Project Description:

Electricity cupboards with a local control (wireless) were prepared around each fishpond, for controlling all the required parameters – air, food, engines, etc. The uniqueness of the local wireless communications was utilized for coordinating the data around the pond and the exit to the RealiteQ system from the central unit for each pond – ICEX-R.3.0.

Unique Capabilities:

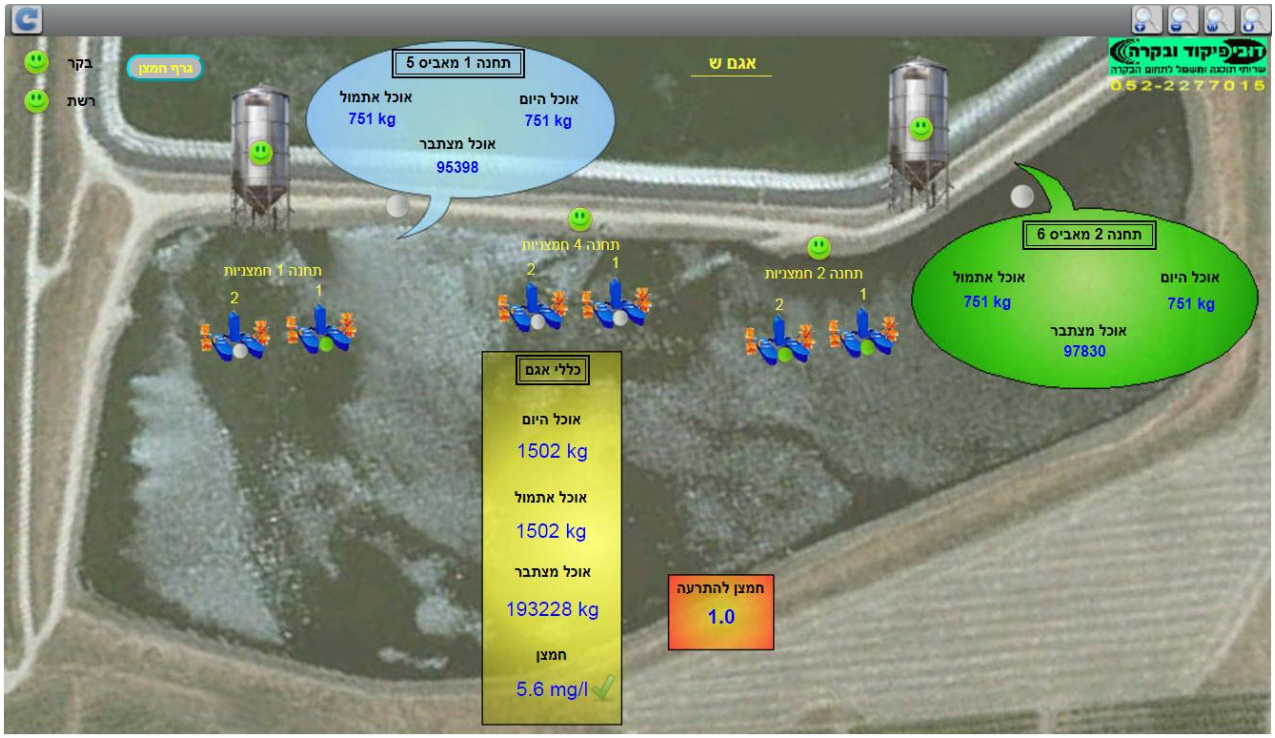
Connecting the multiple local end units to a single coordinating ICEX unit for the whole site and for remote command and control of all the systems in real time.

The major advantage is that there is no restriction on the geographic area for command and control (there is no need to deploy communications infrastructure between the various sites) or on receipt of warning data and analysis capability for each of the parameters according to reports and graphs, and in this way, it is possible to have better knowledge of what is happening.

Conclusion and Results:

The project was most successful, and the customer was very satisfied with the results.

In view of his great satisfaction, the project was enlarged in the second stage to include more of the customer's fish ponds, including ponds in an area 100 km away from the customer's position.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