IoT – Internet of Things

Badger Meter

Hi Tech Low Cost

RealiteQ™

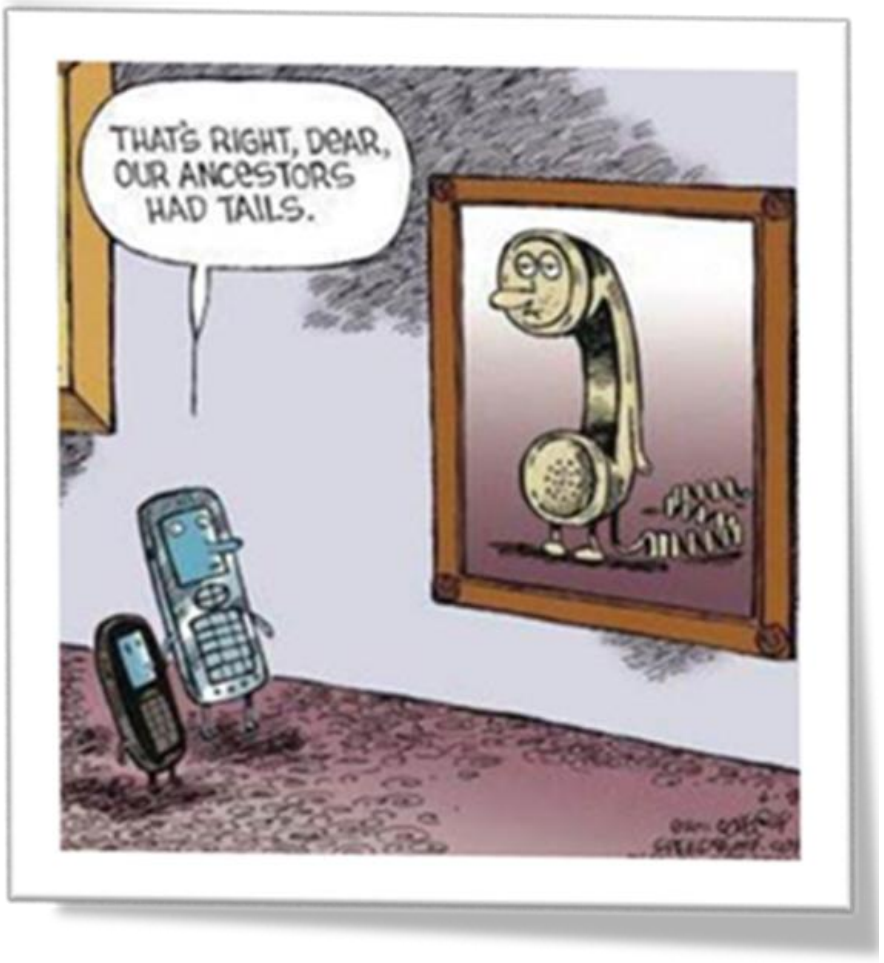
New Generation of SCADA & Telemetry Solution

By Ran Kedem - RealiteQ

Agenda

Hi Tech Low Cost
RealiteQ™
New Generation of SCADA & Telemetry Solution

- About RealiteQ
- About the Market
- RealiteQ technology
- RealiteQ advantages & Benefits
- RealiteQ Case studies
- Summary



Hi Tech Low Cost
RealiteQ™
New Generation of SCADA & Telemetry Solution

Reali Technologies Ltd.

is an Israeli pioneer Hi-tech company, the developer of

RealiteQ -

Cloud based SCADA system

- the new generation (4th) of SCADA.

About RealiteQ

10 years Anniversary

Hi Tech Low Cost
RealiteQ™
New Generation of SCADA & Telemetry Solution

- RealiteQ is a one stop solution provider of Real Time Cloud based Telemetry and SCADA.

- RealiteQ was developed by Reali Technologies LTD., an Israeli company that was established in 2008 and is a technology breakthrough pioneer.

- Today, RealiteQ is a well proven state of the art cloud based Telemetry & SCADA technology for a wide range of applications with thousands of sites in 40 countries in 5 continents.

RealiteQ – Making Waves

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"The Marker " one of the leading Israeli financial newspapers:

TheMarker

A July 2017 Article in TheMarker Magazine:

RealiteQ is amongst Israel's most innovative water-tech companies

"Hundreds of companies around the world chose RealiteQ's system for remote management of water infrastructure"

"RealiteQ broght the IoT and the Cloud to the water supply market"

RealiteQ - Making SCADA Affordable & Available

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	RealiteQ	Traditional SCADA
CAPEX	Low	Very high
OPEX	Less then $ 1/day/site (SAAS model)	High
Infrastructure	Not required	Required
Installation	Simple, fast and inexpensive	Complicated, long and expensive
Maintenance	No (SAAS model)	Yes
IT capabilities	Not required	IT team + equipment are required
Integrative	Can be integrated with many protocols	Usually unique protocols
No. of users	Any no. of users with No extra payment	Payment per user license
No. of sites	No limit	Limited by technology and cost
Catastrophe	Real time multi directional communication	May lose communication or be blocked
Suppliers	One stop solution (Hardware, Software, service)	Usually integration of several suppliers/products

RealiteQ optional usage

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- Water treatment plan
- Waste water treatment plan
- Pumping station
- Reservoirs & water towers
- wells
- Energy efficiency in buildings
- Cooling towers & AC (Chillers)
- EV Charging
- Transformation stations
- Generators control
- Irrigation machines
- Fish ponds
- Distribution system (water, Gas…)
- OEM
- industrial

RealiteQ optional usage

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Water	Wastewater	Energy	Gas
Industry	Agriculture	Second tier Supplier & OEM	

RealiteQ – Smart Water Network (SWAN)

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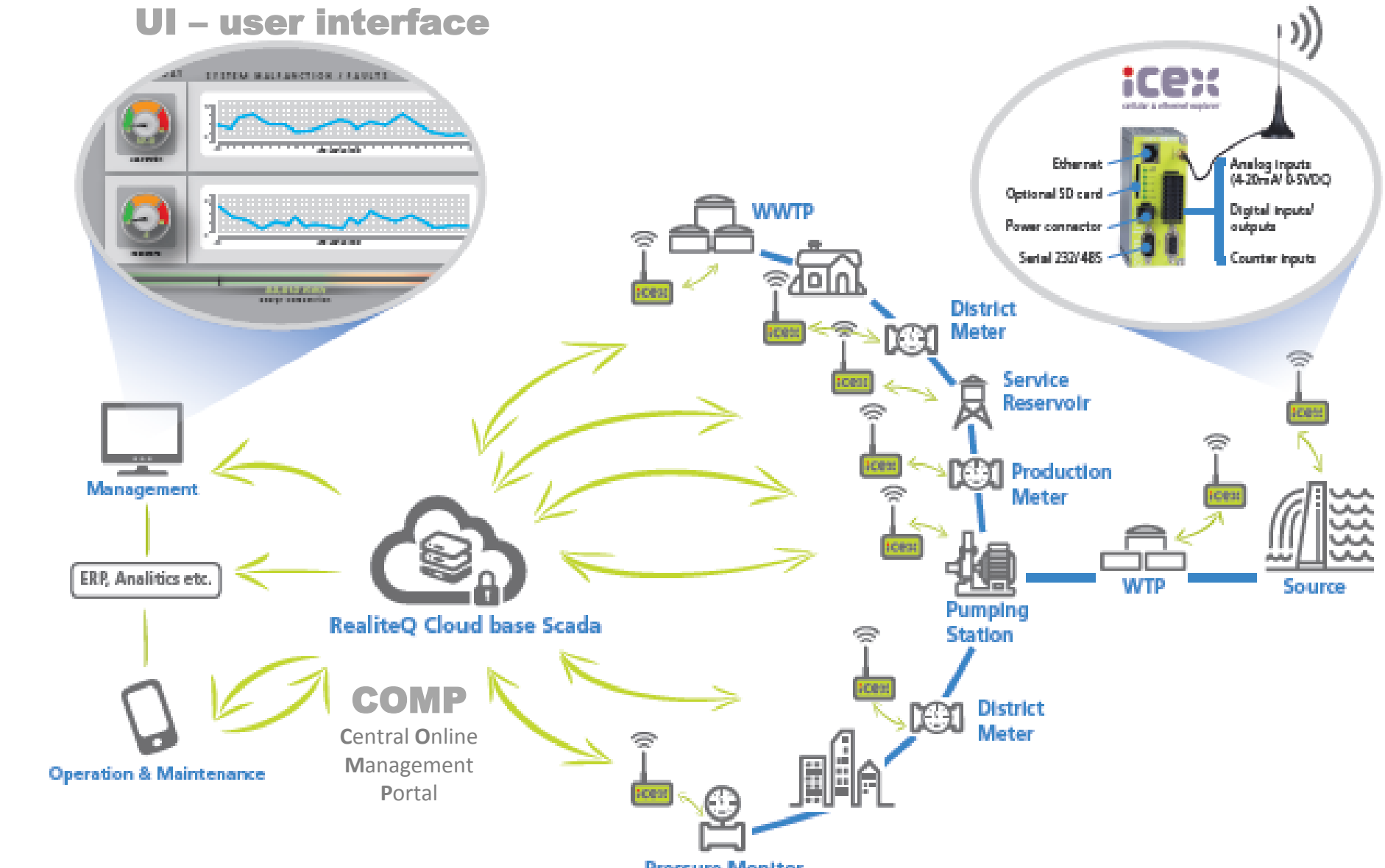
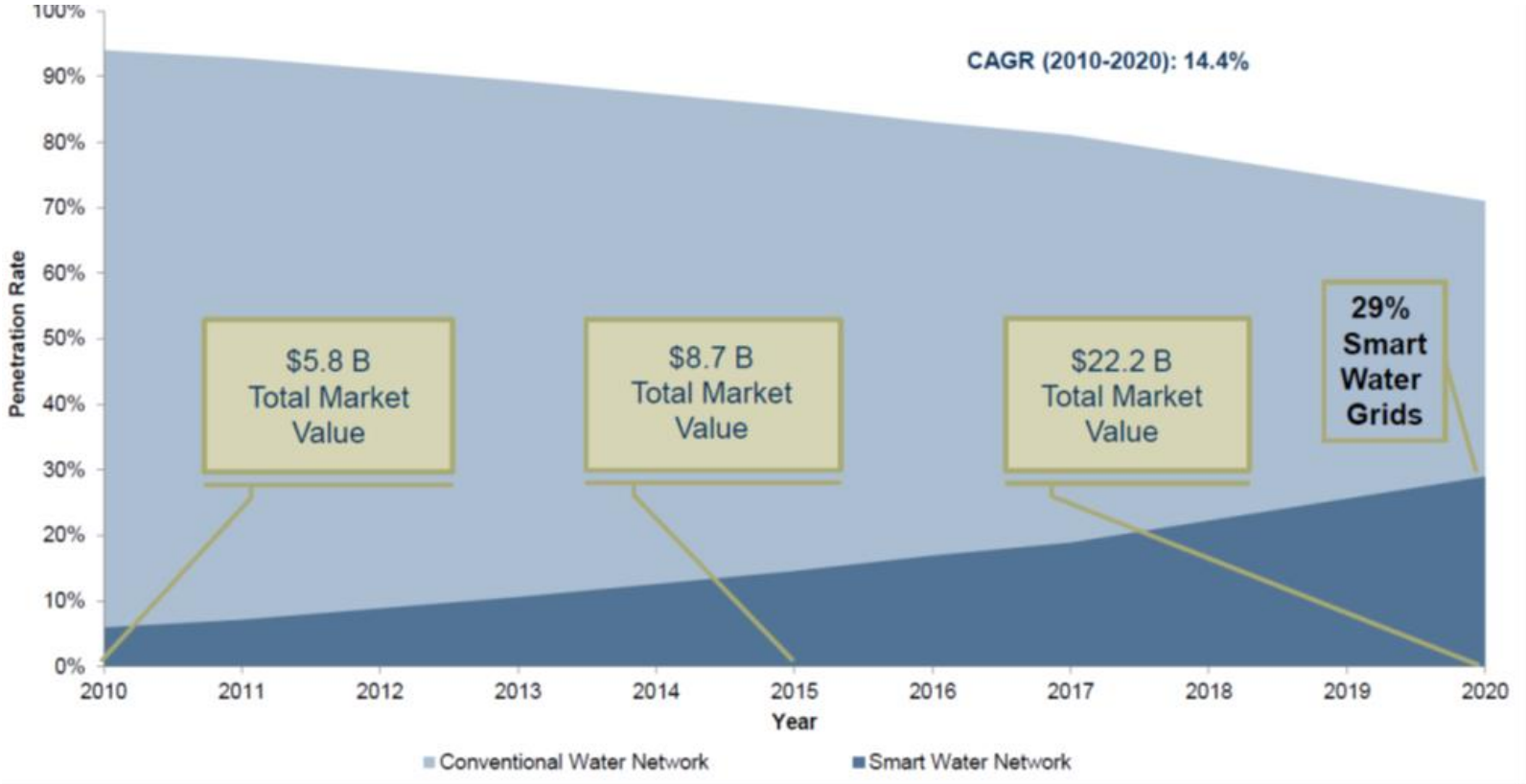


Growth of the smart water and wastewater systems 2010-2020



According to Frost & Sullivan's analysis until 2020, about 30% of the water and wastewater systems worldwide are expected to be smart systems, with the market size reaching a total of about 22 B USD per year.

source: By: Frost & Sallivan,2017

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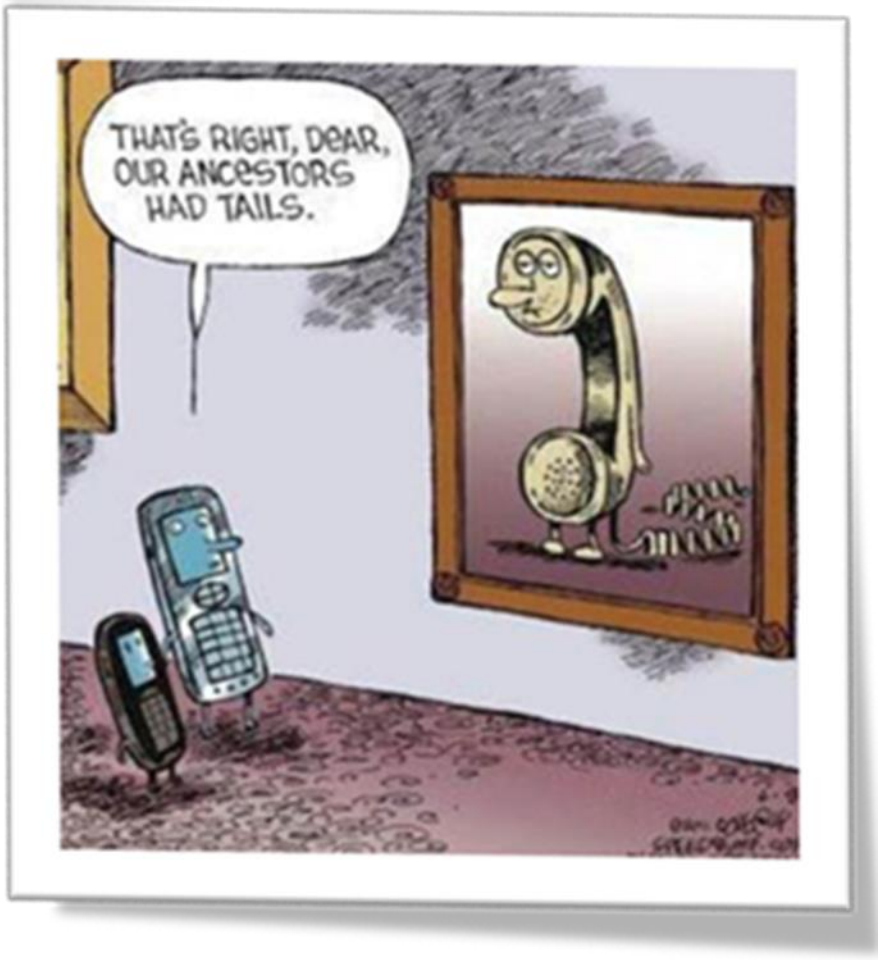

about the technology – (Market research)

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- **“Fourth Generation – Cloud / Internet Based SCADA System….”**

- …” **Cloud-based SCADA dramatically lower the costs** associated with a traditional SCADA system… getting started with a cloud-based SCADA, users can achieve about 90% reduction in costs…”

- …” **Cloud-based SCADA improve the system's reliability**. Cloud computing platform enables water and wastewater utilities to deploy redundancy and disaster recovery capabilities far beyond that found in the typical water and wastewater IT departments…”

Source: 2017 Zion Market Research

Water & Wastewater – (Market research)

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- "The water and wastewater industry is in transition to a digital revolution that has the potential to transform the industry from innovations such as the **internet of things** and machine learning."

- "…there has been an increased uptake of monitoring and control systems that are able to detect changes **in real-time**..."

- "In the future data-feeds and cognitive **computing could** govern water management and inform every decision in the municipal and industrial sectors"

source: Water's digital future, GWI 30.9.2016

Water & Wastewater – (Market research)

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- …Factors that are driving the growth of the market include … increasing adoption of **cloud computing in SCADA** system, increasing infrastructure development in terms of smart cities and transportation and rising adoption of **Industry 4.0 using SCADA** system..”

- ... The SCADA system cannot exist without a thoroughly designed communication network system. …Owing to the applications of **wireless communication system** in large distribution networks, it is expected to continue to gain a large market share in the SCADA communications market..”

source: By: Marketsandmarkets.com
Publishing Date: April 2017
Report Code: SE 2439

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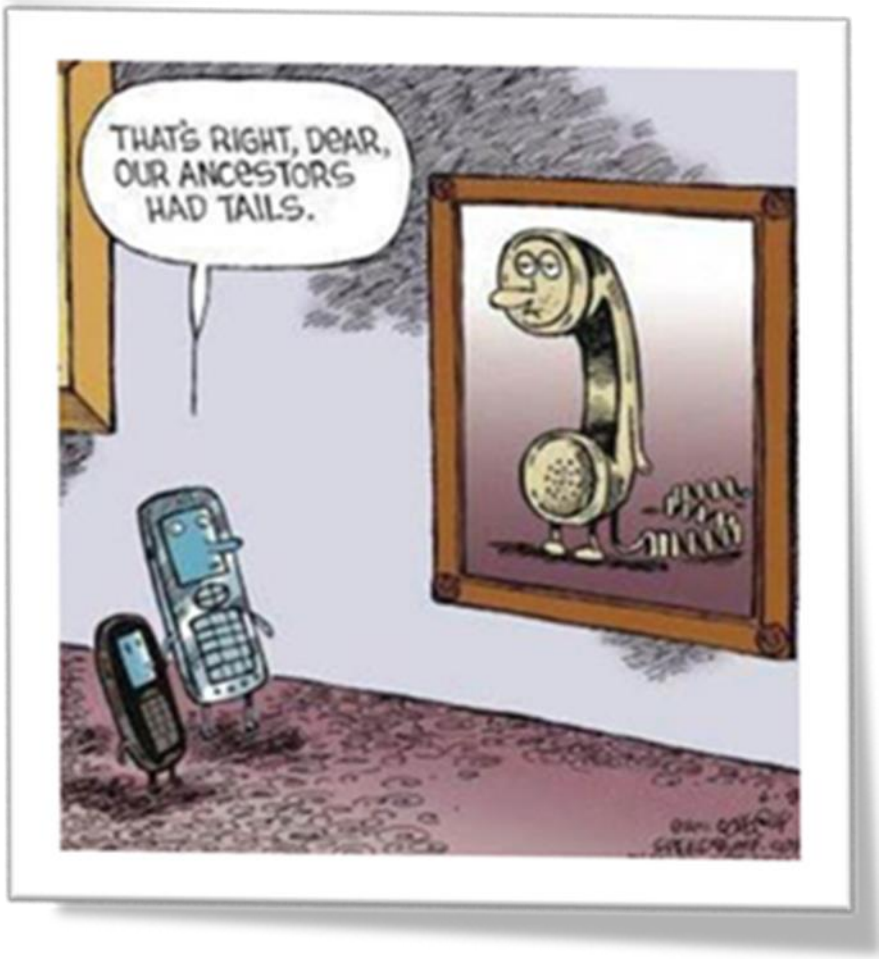

RealiteQ system components (End-to-End)

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iCex (Integrated Cellular and Ethernet eXplorer).
Embedded or Encapsulated Data Producer that explores sensors, analyzers, controllers etc. over I/O, Ethernet or Serial protocols, and link them to the internet by any cellular, satellite or other connection.

COMP (Central Online Management Portal) Mediates all communication, define security and users permissions, manage the Historian, streams live data and send Alarms notification.

UI - Browser based (HTML5) User Interface (HMI/SCADA), displays Real Time information, Alarms, Historical data, Tables & trend charts.
enables Remote operations and modification.
Work with any desktop and mobile device.

Industrial instruments

RealiteQ iCex Gateway data producer

Control system PLC base

Comp

PC, laptop, tablet, smart phone

Electric, water, gas metering

RealiteQ COMP
Central online management portal

RealiteQ™

iCex – Component & Typical installation

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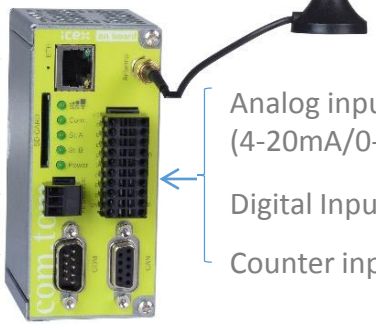
W x H x D: 46 X 105 X 70 mm
1.8 X 4.2 X 2.8 Inch

3G/4G/GPRS/CDMA/

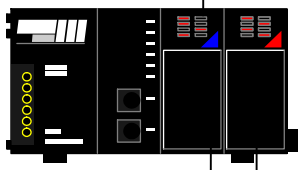


Ethernet
Optional SD card
Power Connector
Serial RS-232/485

Analog inputs
(4-20mA/0-5VDC)
Digital Inputs/Outputs
Counter inputs

Sensor

PLC



Sensor

Meters

Valve

Open Close

The technology

iCex (Integrated Cellular & Ethernet Explorer)

- Remote Data gateway with or without cellular modem.
- A Data producer, generates real-time data from controllers, instruments and sensors.
- Includes serial, Ethernet and I/O interfaces
- Supports standard industrial protocols such as Modbus RTU, Mo DF1, Siemens ProfiNet TCP/IP, GE SNPX and more.

- Does not act as a server but rather as a client that access the RealiteQ servers cluster. By this approach no fix IP and no special or private network configuration is required.
- iCEX itself has it's own firewall. It cannot be accessed even within the LAN. This means, that if hiker somehow will break the firewall and enters in factory network, he will face another one firewall on his way to iCEX. This definitely means, that iCEX is better protected then, at least ordinary PC or PLC in LAN.

The technology

COMP (Central Online Management Portal)

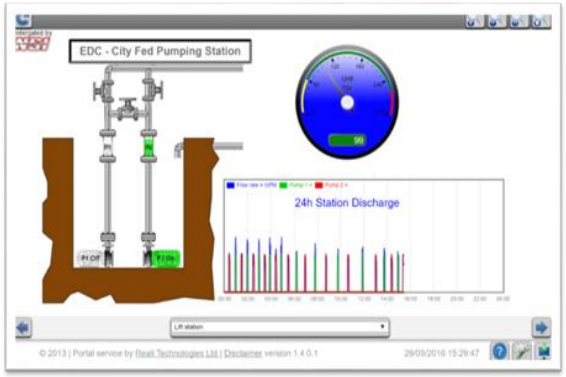
- Mediates all communication of data producers & consumers.
- Stores all system configuration.
- Updates producers & consumers with any configuration, data or command.
- Keeps all security settings and users permissions.
- Manages the historian data.
- Sends alarm notifications.
- Allow basic logic capabilities (Soon to have BI capabilities).
- Allows data sharing among distributed sites.

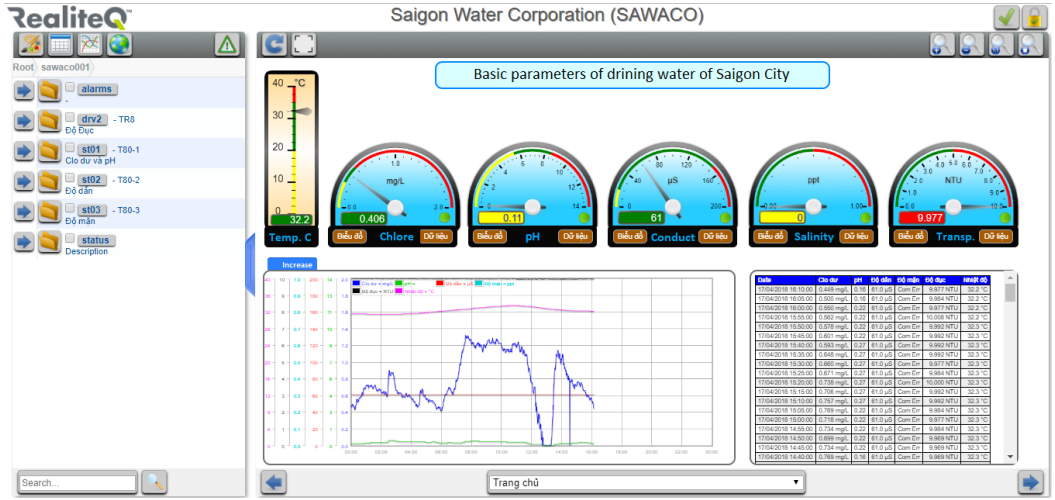
RealiteQ COMP is located at the Amazon server - Option for on premise server

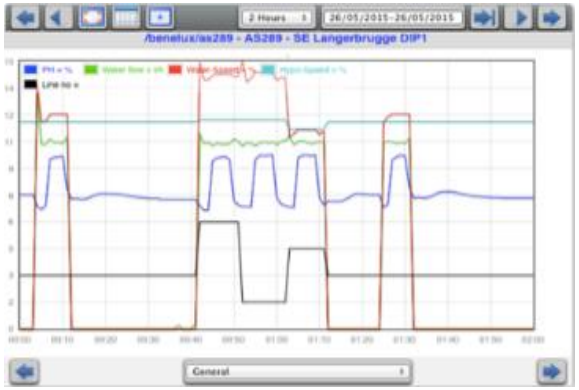
The technology

UI (User Interface / HMI)

- Browser based.
- Screens & Dashboards.
- Build in screen/graphic editor (customization).
- Nodes list management.
- Geographic presentation.
- Report & trends.
- Full alarm management.







RealiteQ security highlights

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RealiteQ invests a lot of efforts in providing highly secured Cloud based solution, using several security levels:

- Reliable Service – Multiple hosting (US projects are connected to Amazon servers).
- Most advanced IoT Security procedures are applied.
- Remote operational notification – any remote change of critical values will generate notification to the relevant personal.
- Option for monitoring only – for critical sites, remote operation is blocked and only remote monitoring is running (upgradable FOC to full service).
- iCEX Does not act as a server but rather as a client that access the RealiteQ servers cluster. By this approach no fix IP and no special or private network configuration is required.
- iCEX itself has it's own firewall. It cannot be accessed even within the LAN.

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System benefits

safty and critical events management

Alarms handling:

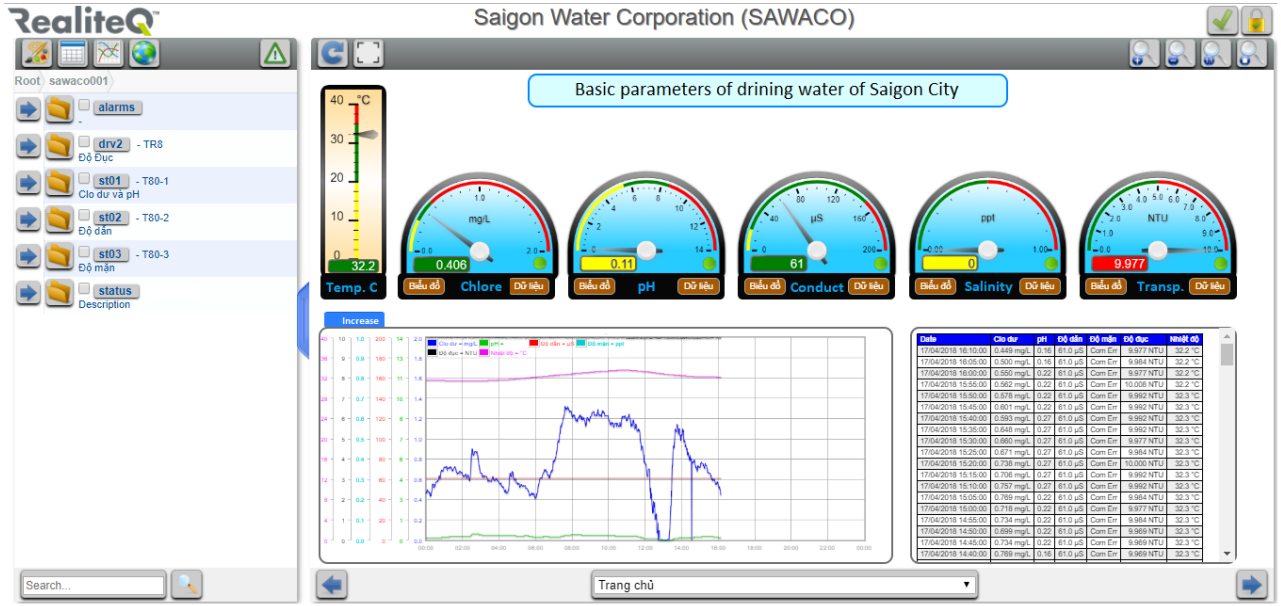
- It is possible to define escalation mode (unlimited escalation steps)
- It is possible to configure “Nagging” for alarms (may also combine Nagging + escalation).
- It is possible to monitor open and duration of alarms as part of the BI part (see below).

System benefits

Special features

Reports & Trends:

- High flexibility - freely selection of each column (in table) and pen (in trends).
- Smart dashboards - Possible to display inside a graphical screen several trends and table.
- Time frame - In graphical screens it is possible to configure a dedicated time frame (day, week, month, year) for each one of the trends/tables presented.

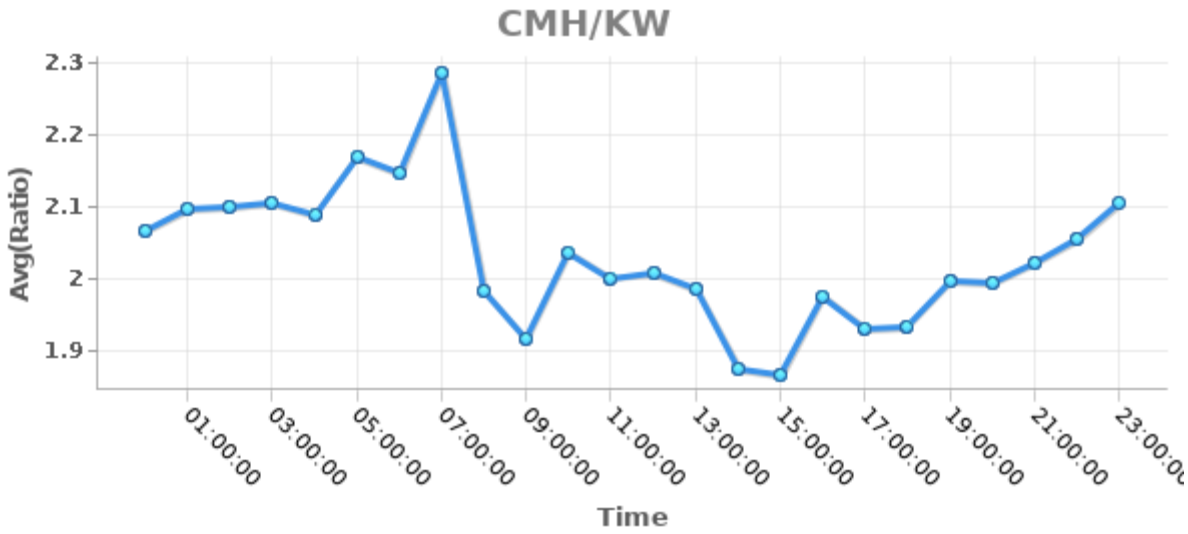


System benefits

Special features

BI (Business intelligence) & Data analytics

- BI functions that use aggregated data and present, as part of the real time system, the calculated results to be used in dashboards and all parts of the system. Some functions are for Alarms (such as average alarm duration, amount of active alarms, amount of historical alarms over period), some are for values (such as Max, Min, Average) and more.



System benefits

Cascade architecture (CASCADA)

- **Site level –** Real time monitoring and control from any device, any place by any authorized personal.

- **Utility level** – Data sharing (& control) visibility of all the utility facilities.

- **State level –** Real time state facilities status, single centralized professional experts support.

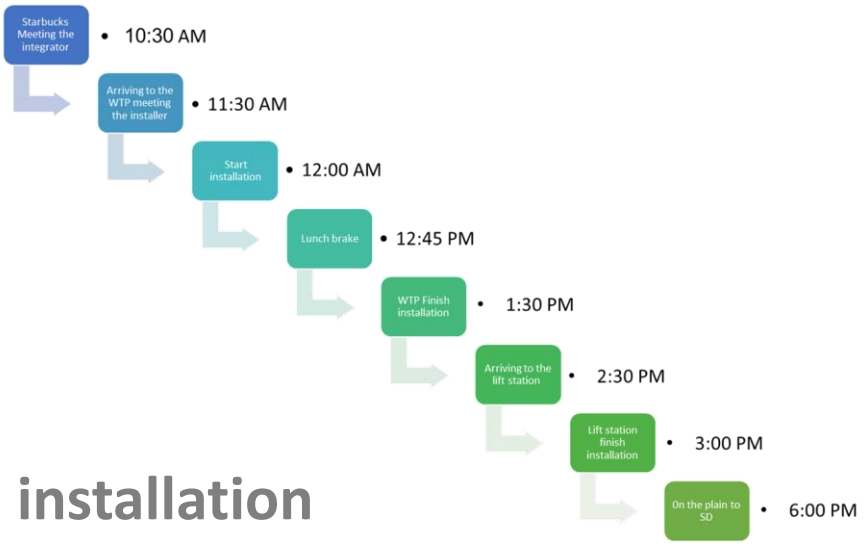
- **National level**- Real time, Managerial and historian information for crises management, real time event channel for immediate (emergency) actions, information analyses for system improvements, BI.

What you can't see you can't improve

System benefits

Installation

- Nearly Infrastructure free - No physical infrastructure is required.
- Fast installation – Instant set up.
- Non destructive installation
- Seamless interfacing with existing equipment & software
- Maintenance free - SaaS model
- One stop shop - End-to-End SCADA (telemetry, HMI, Service).



Headache free installation

System benefits

Using RealiteQ

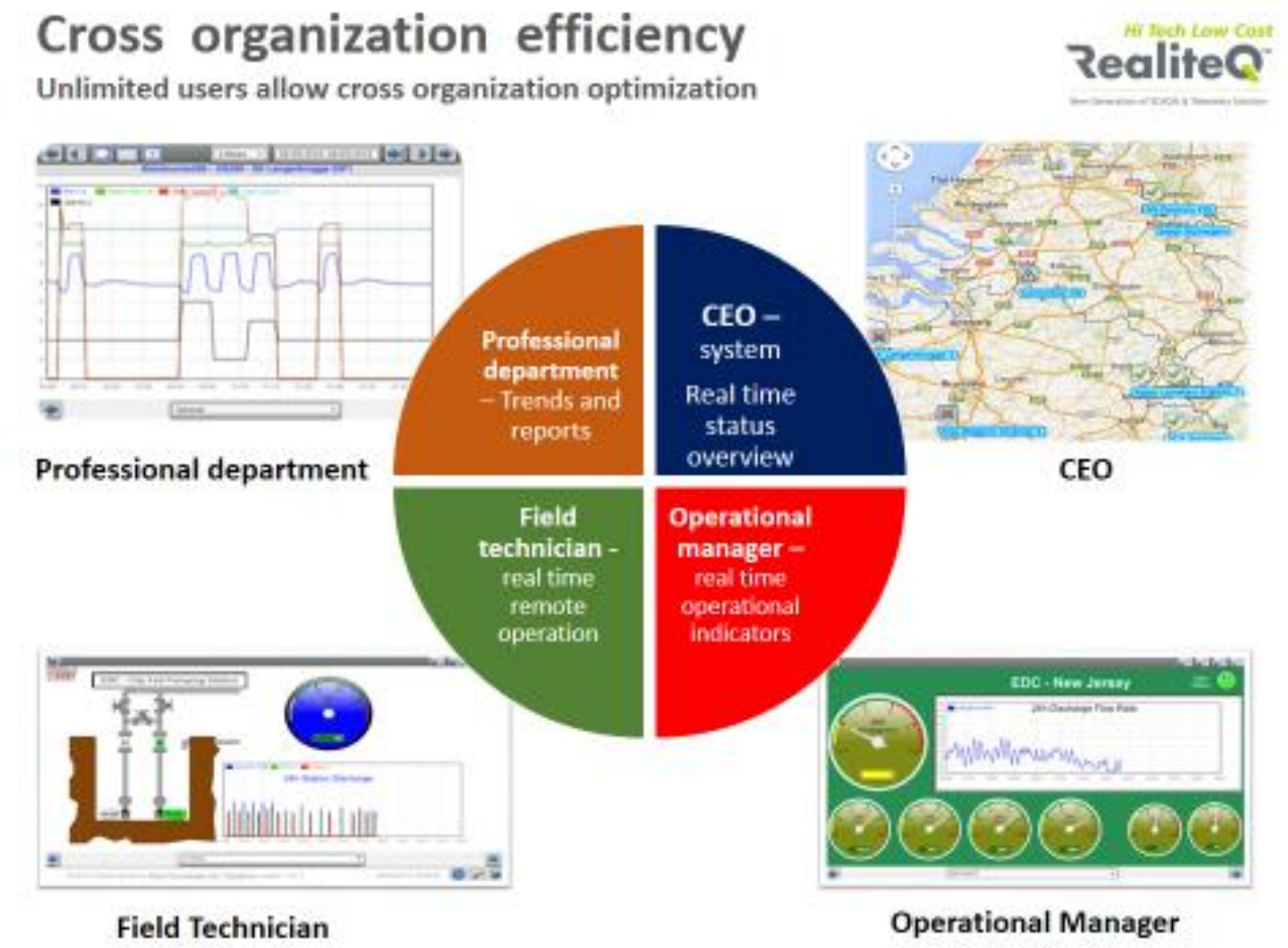
- Real time communication.
- Bi & Multi directional communication.
- Efficient data handling - minimizing of Big Data issues (Smart filtration).
- Automatic backups of data on cloud.
- Easy to use.
- No limits of user (with no extra cost), increase system efficiency.
- No limits of Data (with no Extra costs).
- Self customization and personalization of screens and reports.

Smart & Simple to use

System benefits

Economical

- Low CAPEX
- Low OPEX



System benefits - Special features

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Reports & Trends:

- It is now possible to select freely each column (in table) and pen (in trends) by the user.
- It is now possible to display inside a graphical screen several trends and table for smarter dashboards.
- In graphical screens it is possible to configure a dedicated time frame (day, week, month, year) for each one of the trends/tables presented.

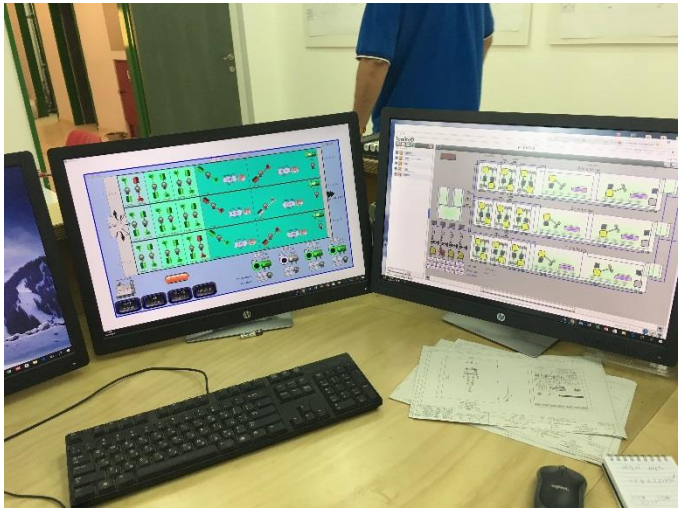
BI (Business intelligence) & Data analytics

- BI functions that use aggregated data and present, as part of the real time system, the calculated results to be used in dashboards and all parts of the system. Some functions are for Alarms (such as average alarm duration, amount of active alarms, amount of historical alarms over period), some are for values (such as Max, Min, Average) and more.

Adapting RealiteQ

in developed utilities

- RealiteQ first projects were in water utilities which already had a traditional SCADA system in some of its facilities.
- RealiteQ can transfer the information to any existing HMI software installed in the utility
- RealiteQ can work in parallel to the existing SCADA (connecting new sites to the existing HMI of old users), and as a stand alone system in the same time (for new users)



RealiteQ allow to upgrade the system in the most cost effective and nondestructive way

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Case Study 1 – Pumping station & WWTP American Water New Jersey USA

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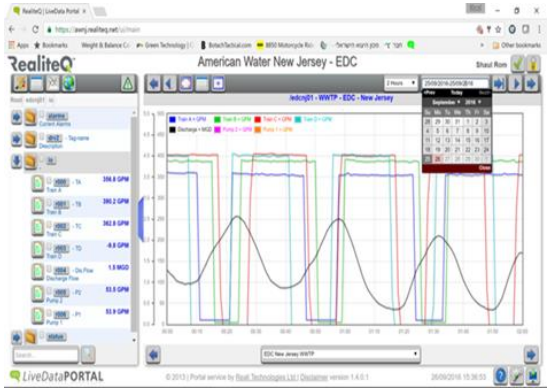
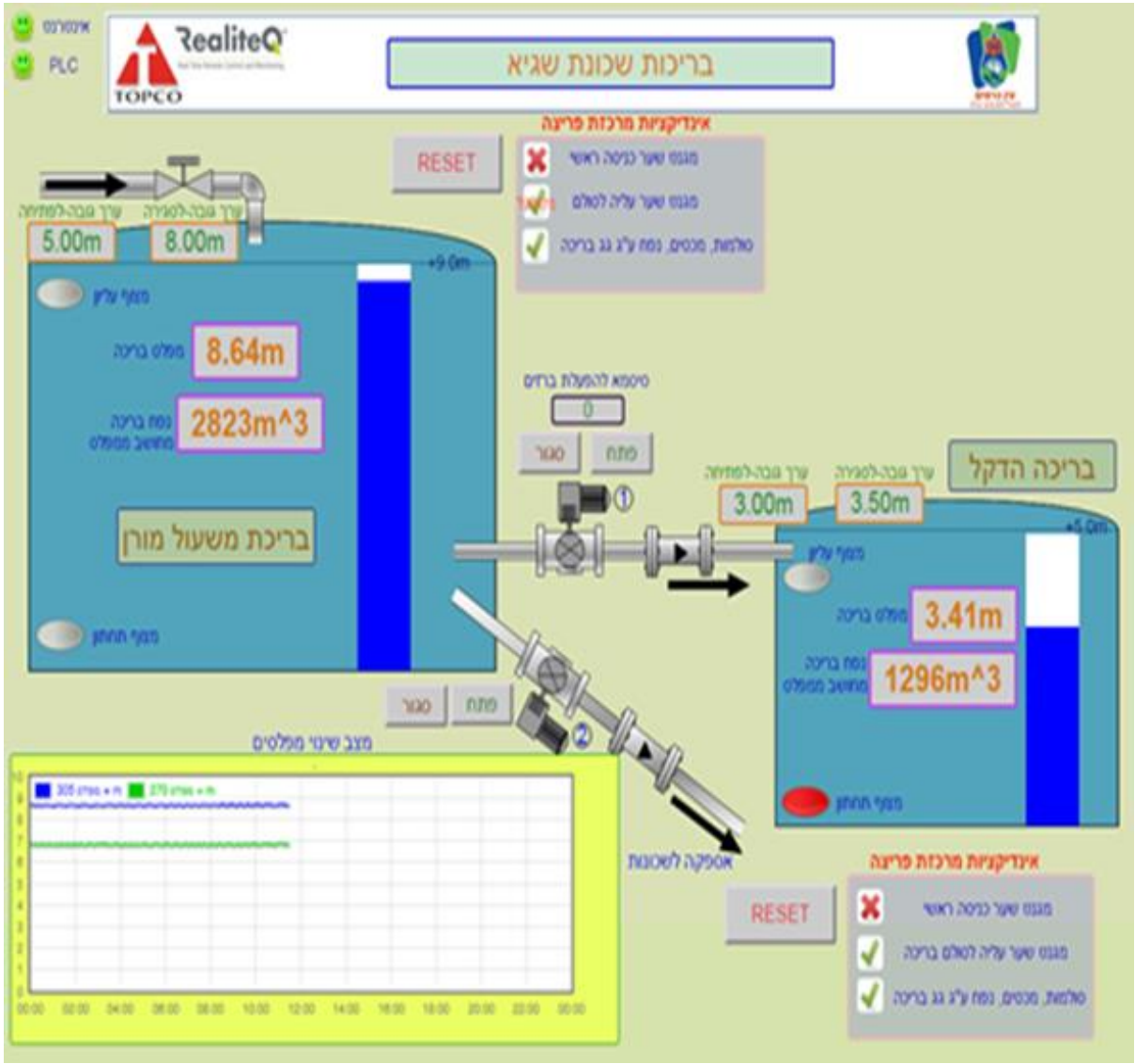
- Starbucks Meeting the integrator • 10:30 AM
- Arriving to the WTP meeting the installer • 11:30 AM
- Start installation • 12:00 AM
- Lunch brake • 12:45 PM
- WTP Finish installation • 1:30 PM
- Arriving to the lift station • 2:30 PM
- Lift station finish installation • 3:00 PM
- On the plain to SD • 6:00 PM



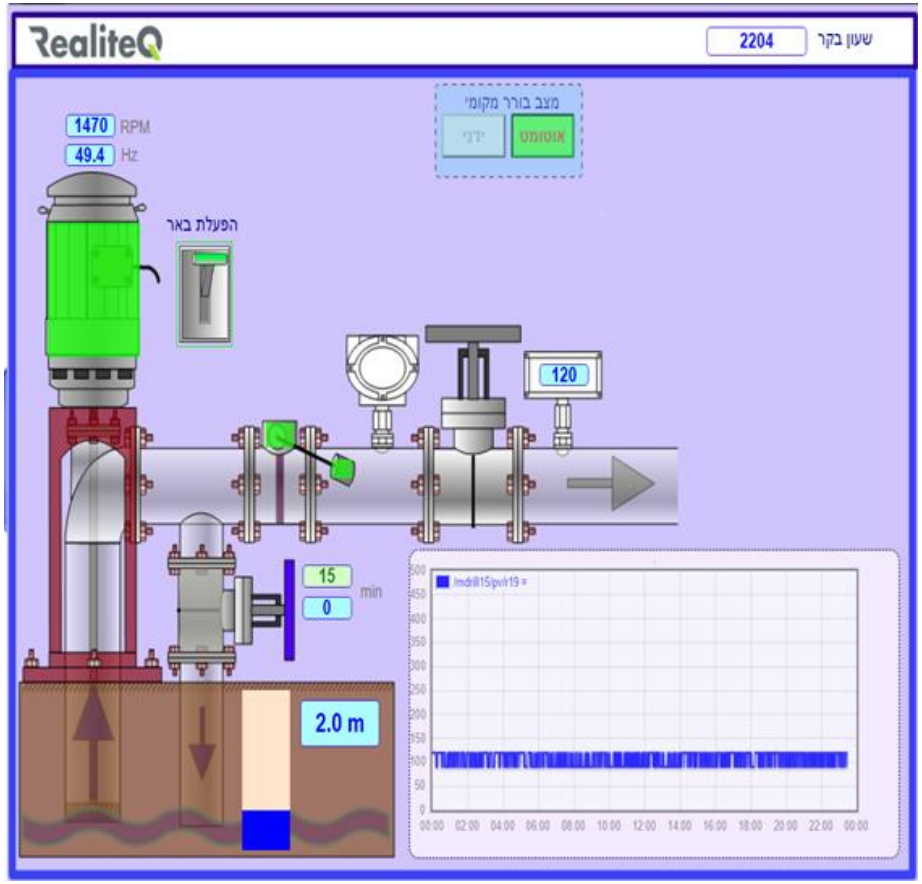
Case Study 2 –Supply of Drinking Water to City of Carmiel, Israel



Case Study 3 –Desalination Plant, Maagan Michael, Israel

Background:

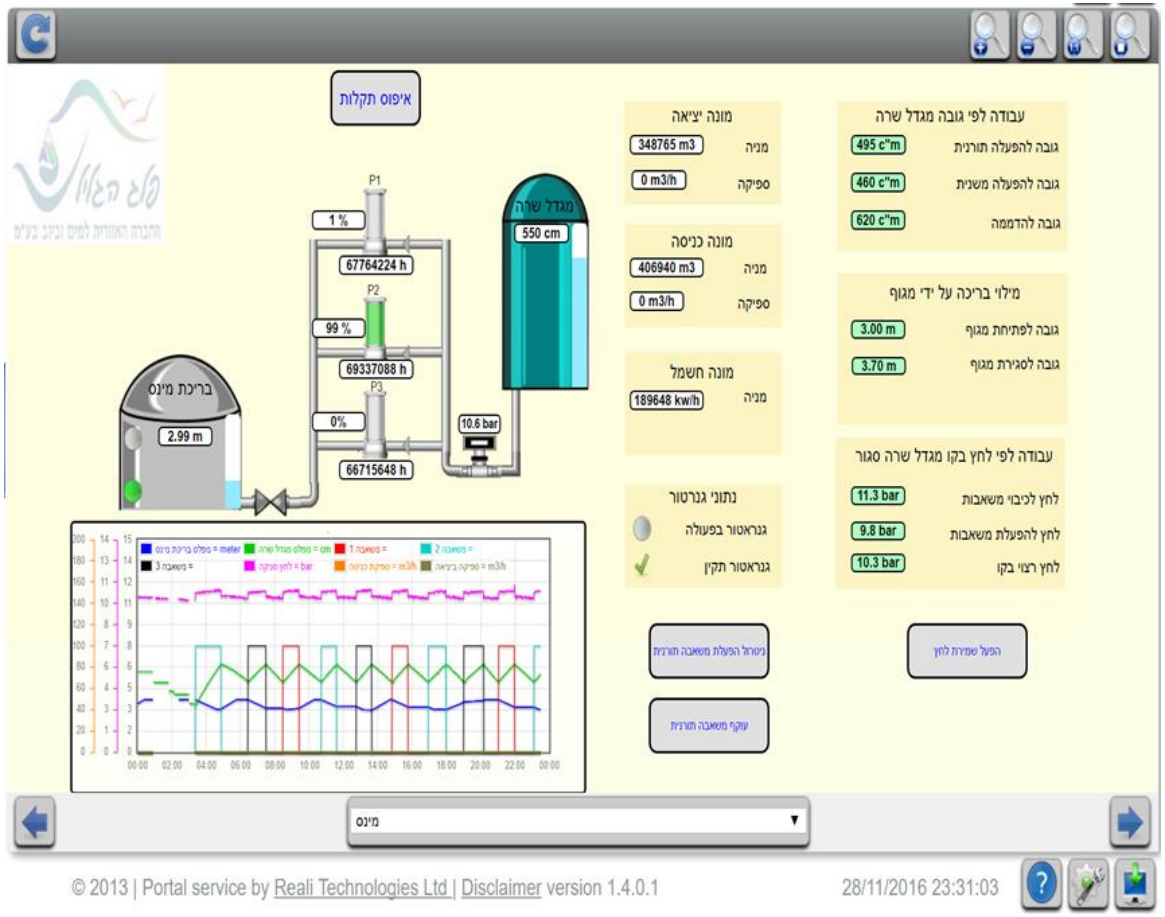
In 2009, RealiteQ was asked to upgrade and replace the Motorola radio system, which was highly inaccessible to both the operators and the regular service providers. The system was intended for both local and remote control at all the bores (near to the coast) that provide brackish water to the desalination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



Case Study 4 – Peleg Hagalil Regional Water & Sewage Corporation

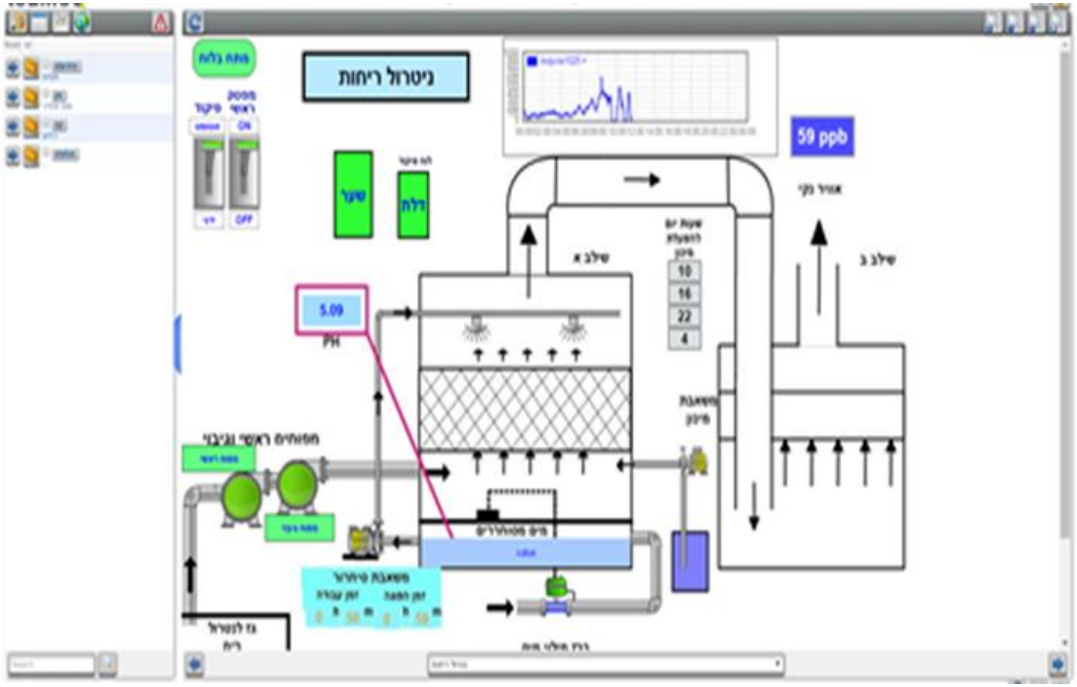
Background:

A monitoring system for the sewage and water stations and water treatment plants of the Peleg Hagalil Regional 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.



Background:

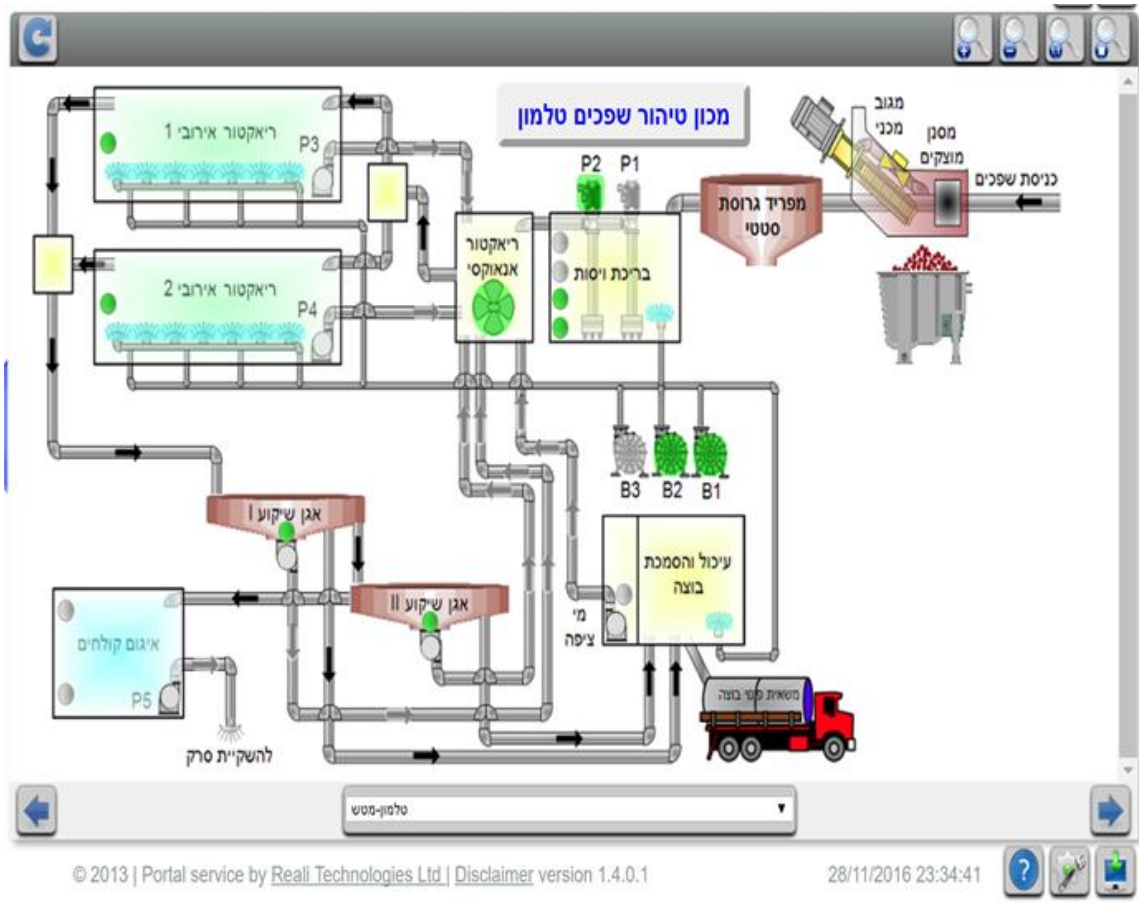
In 2009, RealiteQ was asked to provide a solution for monitoring and operating the sewage and water stations of the Peleg Hasharon Water Corporation. The system was intended to provide a solution for the maintenance personnel for the purpose of regular operation of the various installations that are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



Case Study 6 – Water & Waste water 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.



Case Study 7 – Monitoring & Control of drinking water wells, Israel

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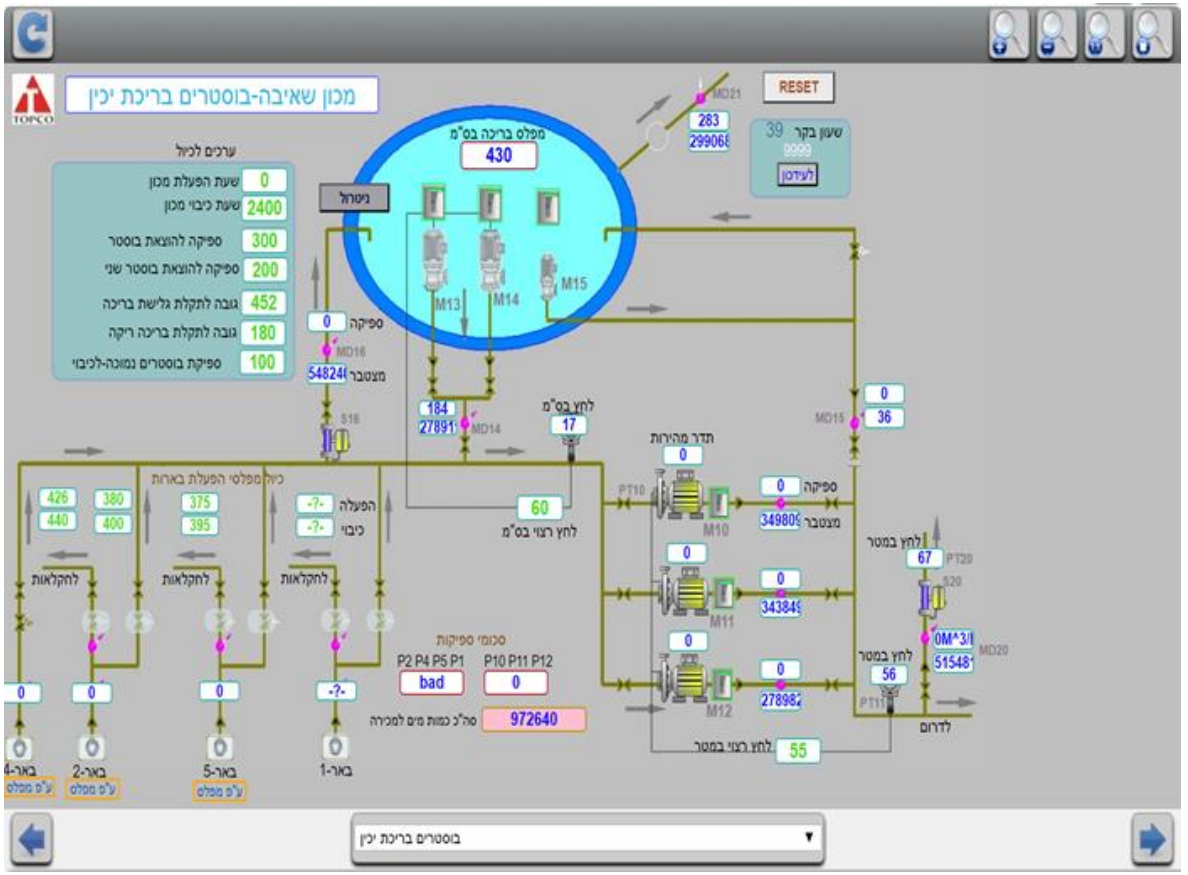
Background:

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.



Case Study 8 – OEM Increasing Energy Efficiency in Cooling Towers (world wide)

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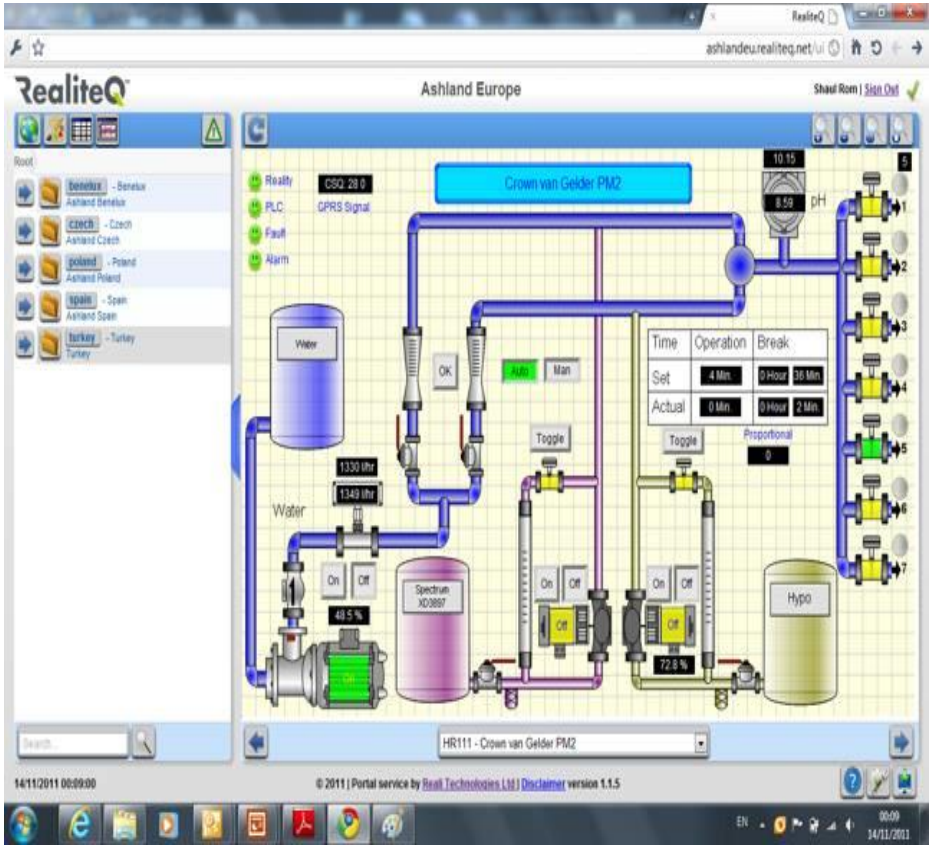
Background:

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.



Case Study 9 – OEM – international chemical company (World wide)

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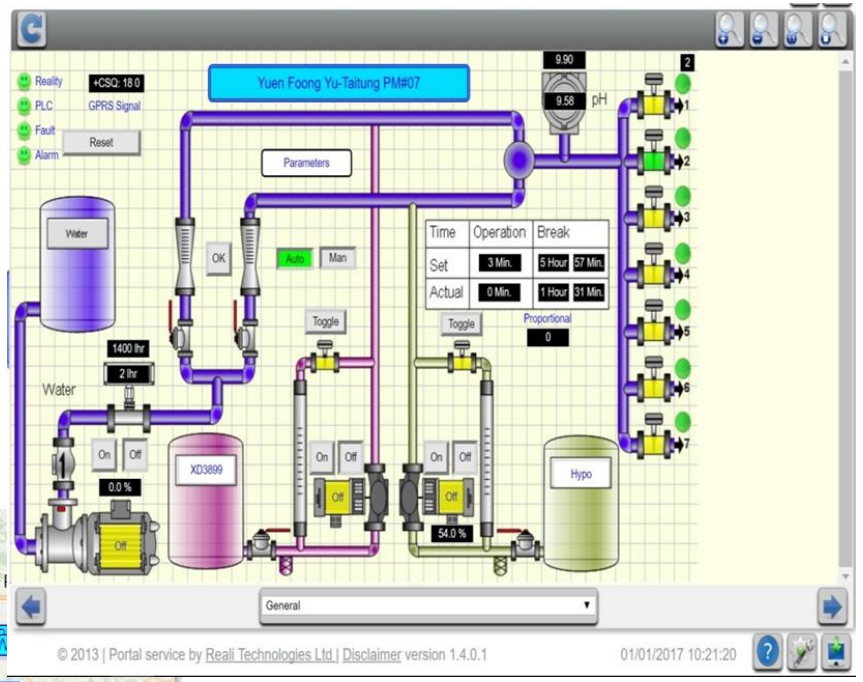
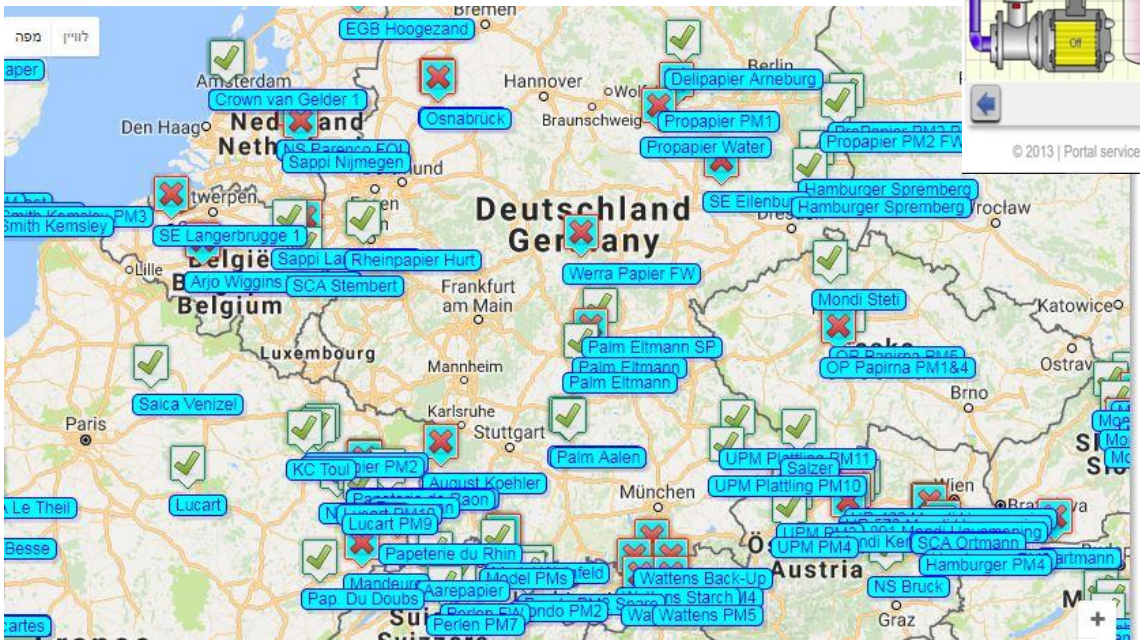
Background:

Solenis (Hercules Chemicals, which was later purchased by Ashland and is now called Solenis) 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).





Case Study 10 – OEM – virtual Power Plants, Germany

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Background:

The German company TBS 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.

In the initial stage, Exor purchased the hardware from RealiteQ and supplied it to the customer, while TSB purchasing the service and software directly from RealiteQ.

Case Study 11 – Industrial & Agricultural Desalination system (world wide)

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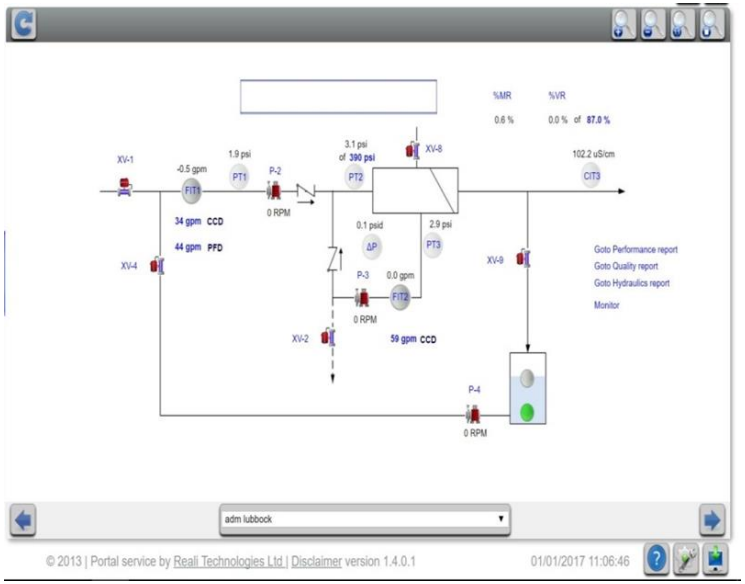
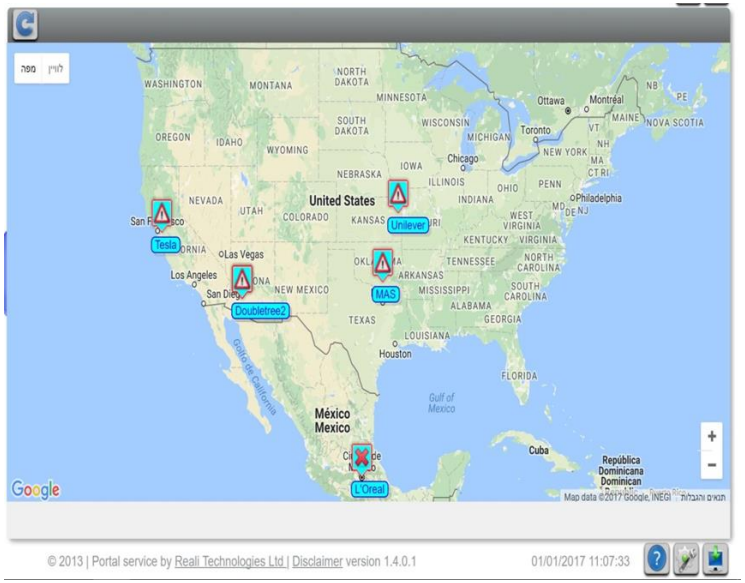
Background:

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

The distinction of this project is that the RealiteQ system is the supervisory and control component of the water desalination facility, which is installed in the facility by Desalitech 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.





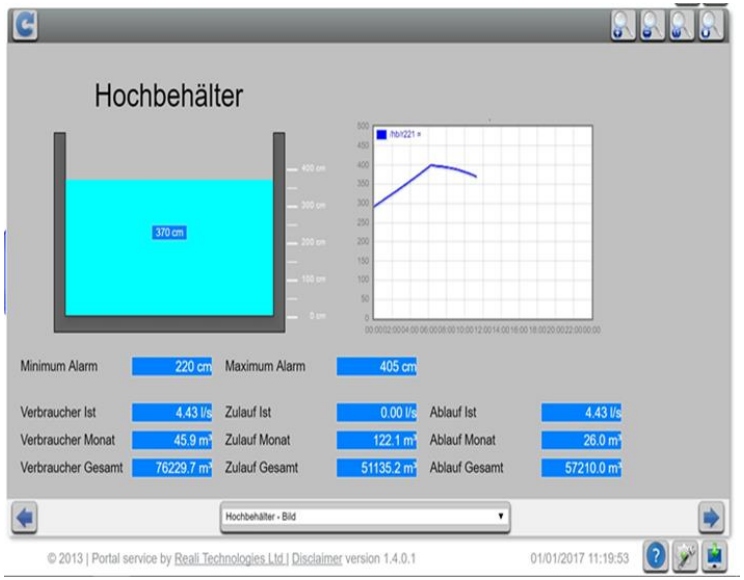
Case Study 12 – RealiteQ System interface with GE system, Austria

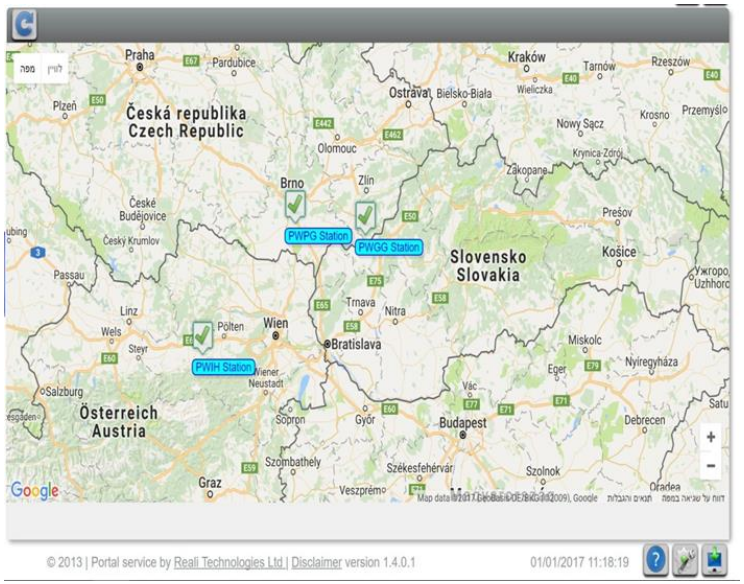
Background:

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.

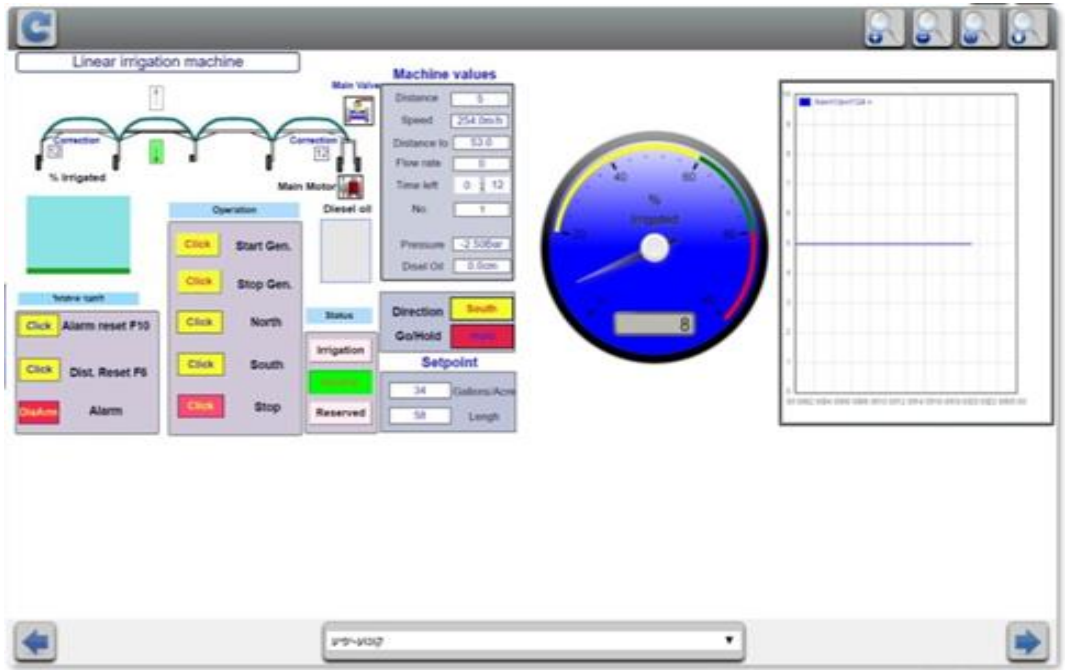




Background:

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

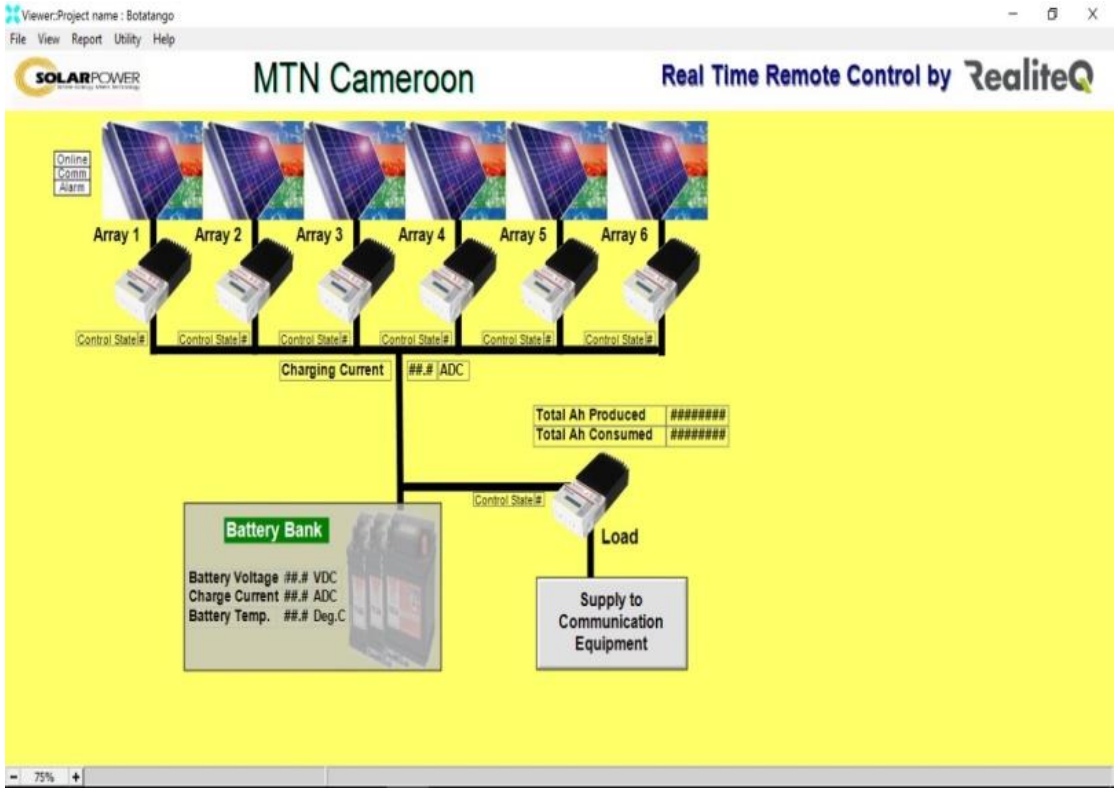
The irrigation machines move in a linear or circular manner at slow speeds, and irrigate the terrain they pass over. As they are machines in every sense, they are powered by a diesel engine or an electrical motor, and feature various controls for speed, direction, motor management and securities/protections, 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.



Case Study 14 – Solar energy fed cellular communication base station, 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 is also active in Cameroon.

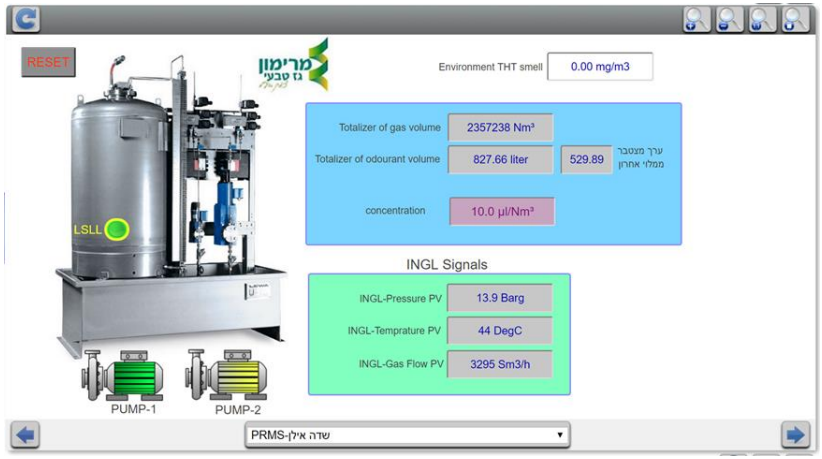


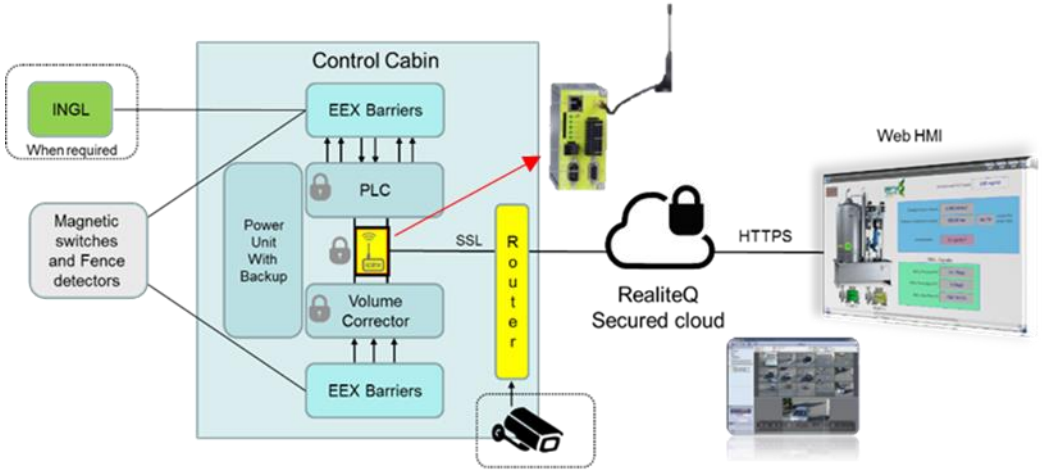
Case Study 15 – SCADA and security in Neutral Gas infrastructure

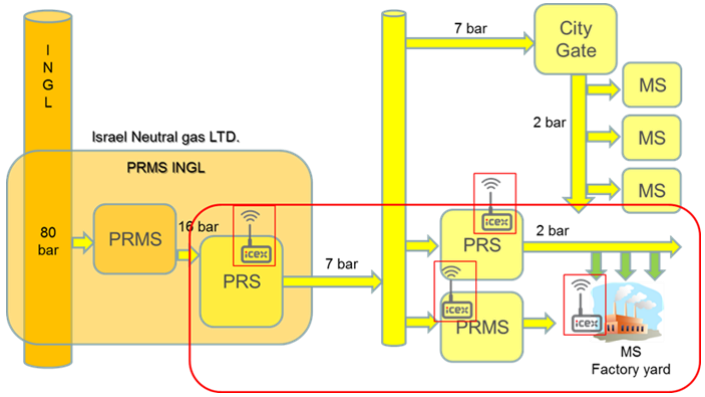
Hi Tech Low Cost
RealiteQ
New Generation of SCADA & Telemetry Solution

Background:

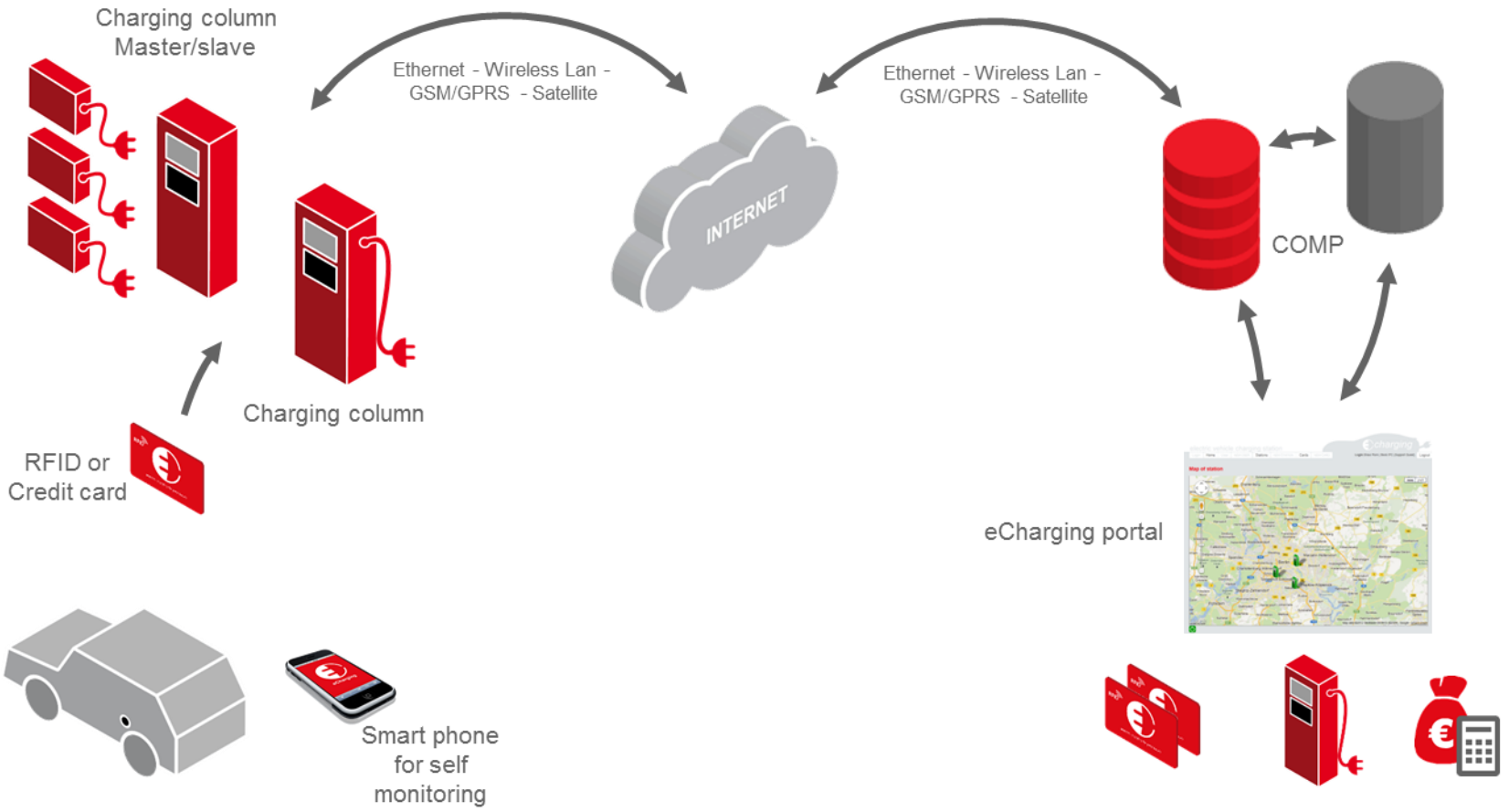
Reali Technologies with its RealiteQ platform offers communication solutions for remote monitoring and control of oil & gas facilities.
Whether the process is drilling, refining, filtering, PRS, PRMS, city gate or other, RealiteQ is the perfect technology for remote control and monitoring.
With RealiteQ, you have a reliable and cost effective solution for monitoring gas well production, pipeline flow, distribution system pressures and more…







Control and IT - Overview



Agenda

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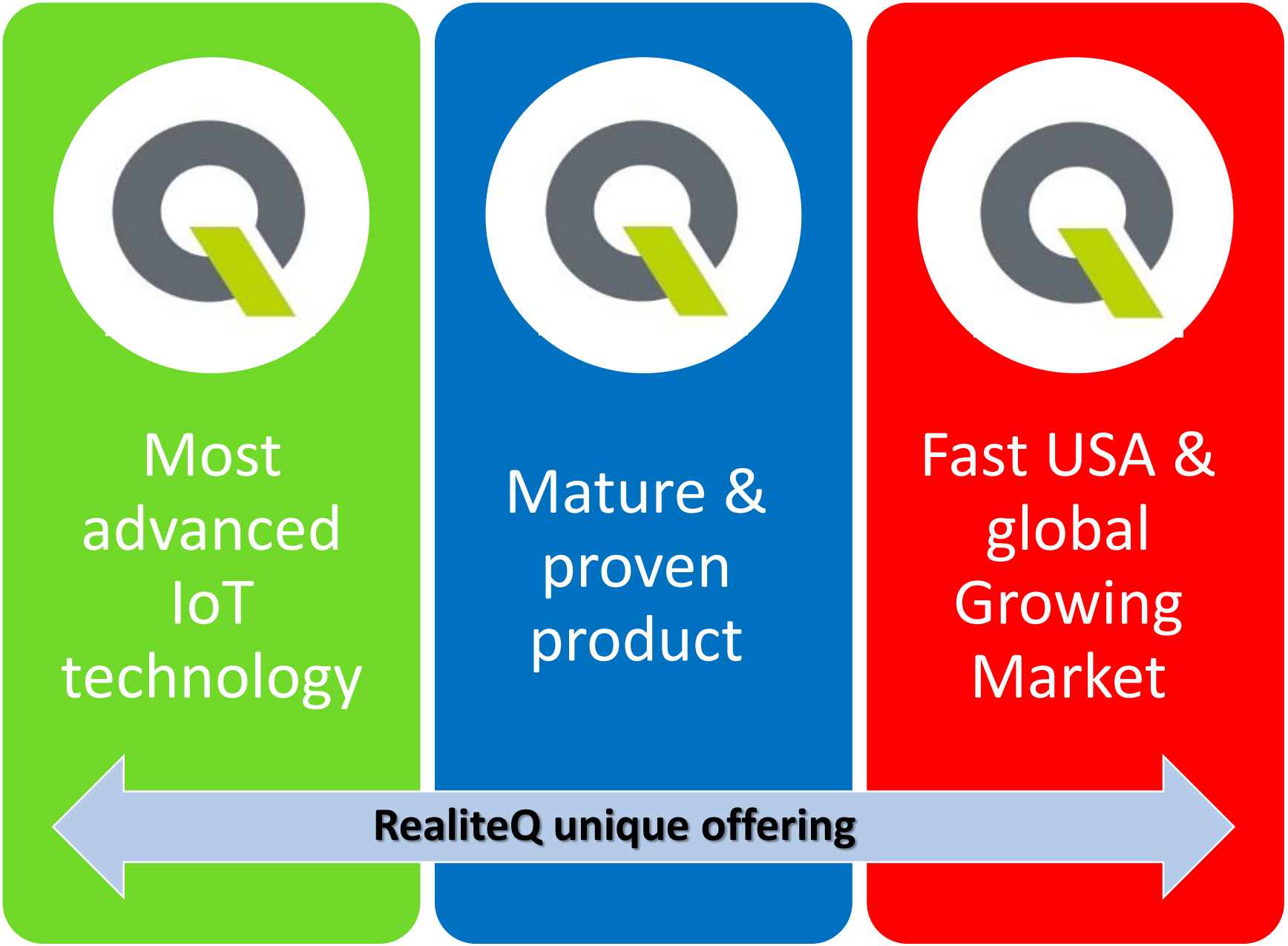
- About RealiteQ
- About the Market
- RealiteQ technology
- RealiteQ advantages & Benefits
- RealiteQ Case studies
- Summary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Thank You!

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