

Connecting several remote stand-alone SCADA systems to one centralized SCADA system Introduction

Realite Technologies is an Israeli leader in Web SCADA and telemetry technology, providing IoT (Internet of Things) cloud-based Real Time Management solutions for water utilities.

Realite Technologies was established as an Israeli breakthrough technology startup in 2007 by two experienced engineers, both well established in the field of control and automation for the water market.

Today, Realite Technologies has an advanced proven technology named RealiteQ for a wide range of water and wastewater applications, with thousands of working sites in 40 countries and 5 continents including In Israel, the USA, Europe and around the world.

RealiteQ is the most advanced Smart Water Network solution available today. With RealiteQ you can manage better crisis events by having Real-time warnings for exceptional events. You have the ability to Manage & Control remotely all system components. The real time Information enables improved service, quick reaction time to malfunctions. By RealiteQ contributes for better and safer management of both simple and complex water, waste water and energy networks

RealiteQ SCADA components:

RealiteQ is End to end SCADA solution (Telemetry & HMI software) & service which was developed as an end-to-end information and communication technology (ICT) that gathers and controls critical & operational data, in real time, for water networks, analyzers and controllers. Relevant personnel, from the CEO to the field technician, wherever they may be, can view and control the system. The technology consists of three system components:

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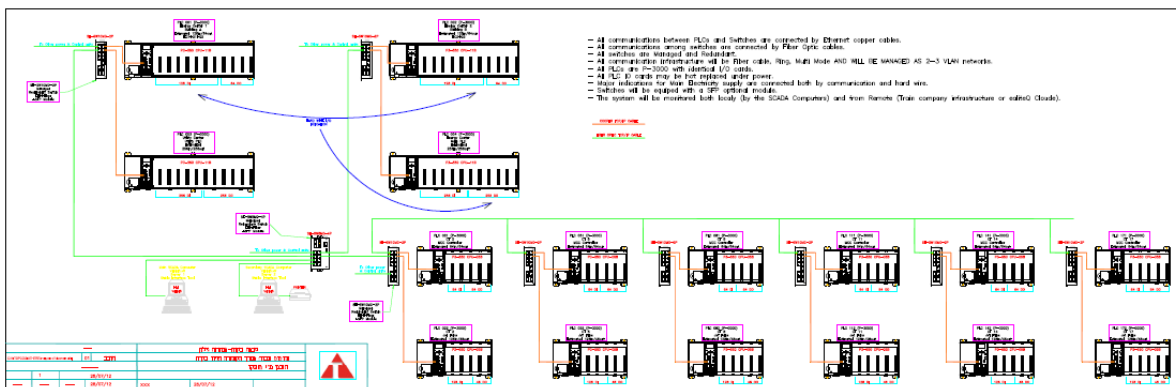
- **ICEX** (Integrated Cellular and Ethernet Explorer) – The end unit installed in remote sites.
- **COMP** (Central Online Management Portal) – Mediates communication, data, security & users.
- **UI** – Browser-based graphical user interface (HMI/SCADA).



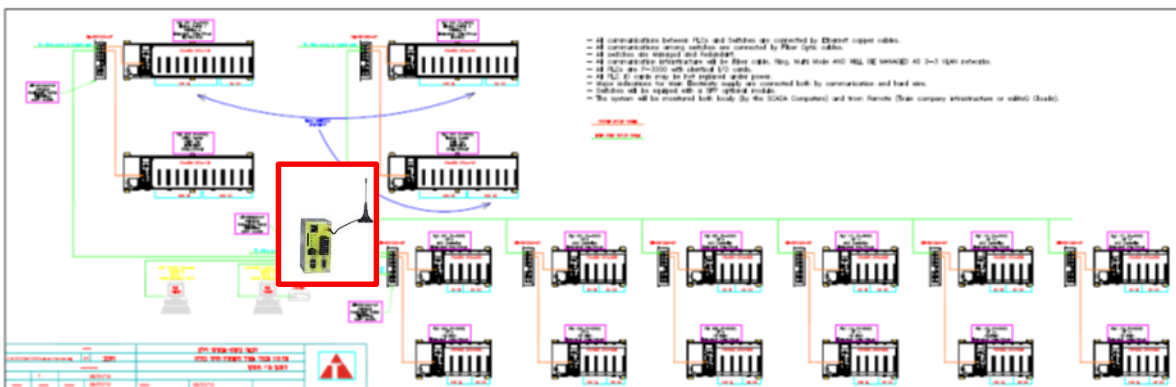
Cartelization of SCADA stand-alone systems by RealiteQ - The solution

The way to do it is by installing the RealiteQ end unit iCEX in each of the sites, in most cases in the electricity/control cabin in/near the control room where all the controlled equipment is connected to the PLC (One or more). The icex will collect the data from the PLC (Data acquisition) and will transmit it to the COMP. then any authorized personal will be able to connect to the project portal using any device which can be connected to the internet (PC, lap top, tablet, smart phone) from any place.

In the following drawing you can see atypical stand-alone SCADA system where several different units are connected to the on-site control room.

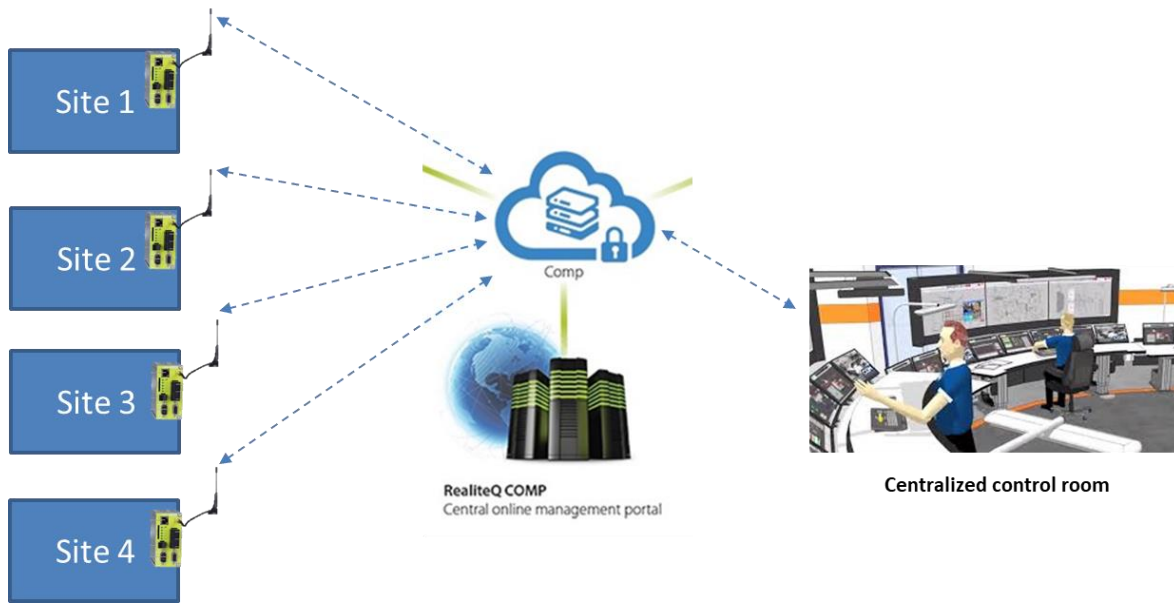


Now, what we are doing in order to connect this site to RealiteQ COMP is by adding the iCEX in the entrance to the control room as seen in the following draw (see red box in the drawing below).



The same is done in all other sites (no limits of no. of sites) so we will get a connected network of all the sites via the RealiteQ SCADA as shown in the following draw.

Option A – using RealiteQ cloud at Amazon Server



Option B - RealiteQ enterprise own Server



RealiteQ enterprise own Server

In Case the utility don't want to use RealiteQ server at Amazon we can supply an enterprise own Server which will be located at the Enterprise control room. The server is actually an array of 3-5 servers which hold the entire software which usually located at RealiteQ COMP and replace it so there will be no need to use RealiteQ cloud server.

When the project will be completed all the sites will be connected to the same centralized SCADA system in a way that all the projects will be seen in a real time on the screen in any way wanted (map, dashboard, operational drawing or reports & Charts).

Conclusion:

Not only, that such a work can be done by RealiteQ, it has many more advantages that can make the SCADA system not only an advanced centralized SCADA system, it is simple, fast and none distractive installation, and in the same time it is also easy to use, easy to maintain and most important thing – it is affordable as for its cost effective price.

RealiteQ SCADA system benefits:

- Most advanced technology - Web based (IOT) technology
- End-to-End SCADA solution (telemetry & UI software)
- Real Time communication
- Bi & Multi directional communication
- Seamless interfacing with existing equipment & software
- Low cost (CAPEX & OPEX) high performance
- Highly secured & safe
- Efficient data handling -minimizing of Big Data issues
- Automatic backups of data on cloud
- Easy to install & use
- Fast & nondestructive installation
- One system one supplier (one stop shop)
- Self-customization and personalization of screens and reports

New System capabilities.

As part of the ongoing support that RealiteQ is providing with the system is free upgrades from time to time. In the last system upgrade from January 2018, some new interesting capabilities were added to the system and today they are available to all users as follow:

Security & Safety:

- An advanced Firewall has been added to iCex (field gateway) new hardware.
- A “Monitoring only” configuration file allows monitoring only and blocks any (!!!) remote operation activities.
- A “Value Change” Notification, function which allow, for sensitive remote operations, a real time notification message to the relevant person in the utility with the details about the user that made this change and the new value (so any remote unauthorized change will be notified in real time and will be re change to the original value with no time).

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).

Reports & Trends:

High flexibility - freely selection of each column (in table) and pen (in trends) by the user.

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.

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, and amount of historical alarms over period), some are for values (such as Max, Min, Average) and more.

References:

Most advanced technology yet a mature product since 2008

- More than 4000 sites in 40 countries in 5 continents
- Global leading enterprises: Jonson Control, Schneider Electric, Tesla, Volkswagen, L'eoreal, Solenis(Chemicals), Unilever, Coca Cola, city bank, AMC-ImdexGroup (mining)

Next Step:

We think that the best way to start is by having a pilot project in 3 – 5 sites, after that it will be easy to add to the pilot project any amount of new sites.

In order to make the pilot fast and unexpansive we can do it using the RealiteQ cloud Server. After the pilot will be finished it will be very easy to expend the system to the entire system and then the utility can decided if they would like to use RealiteQ cloud (Option A) or to use their own server (option B)

In order to decide about the appropriate connection of existing facilities to RealiteQ SCADA we need some more information about the structure of the existing system.

- Single or multiple PLCs?
- Type of PLCs.
- Serial or Ethernet connection to the HMI computer in control room?
- Any other free com port in PLCs?
- If possible, which protocol the HMI is communicating with the PLCs?
- Which HMI is installed?

Beside this information, we'll need for the next step the documentation of the installed PLCs programs so we can configure RealiteQ parameters. This information is normally received from the integrator/utility employees that has implemented the PLCs program.

In some cases, if the HMI is familiar and we get the authorization, we can get the PLCs memory mapping from the existing HMI/UI.

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