

WWTP Performance Remote Monitoring Tool



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DESCRIPTION AND SPECIAL FEATURES

AquaScan is an Internet-based service for remote monitoring and integrated management of decentralized WWTPs. AquaScan is a multi-User and multi-WWTP service. It has been built according to criteria such as flexibility, scalability and interoperability with the idea of providing an open environment suited to quickly accommodate future scenarios such as incorporation of new plants or upgrading of existing installations.

The management of plant information and users interfaces have been implemented in distributed software components that communicate with one another via Web services. The implemented Web services (API) can be exploited to develop customized user interfaces for visualizing the monitored data. The main functionalities offered within AquaScan are:

- Real-time storage and monitoring of on-line signals
- Laboratory measurements storage and plant work logging (reports),
- Visualization of data in plots, data files or current values (synoptic)
- Remote changing of operational parameters/automation telemaintenance
- Event notifications (email/text-message/Web): alarms, warnings, gone beyond limits, set-points changes, power cuts,...
- Automatic execution and visualization of derived calculations (from data)
- Web-cam integration, plant captures and bidirectional communication, ...
- User management (usage reports) / roles / permissions / security

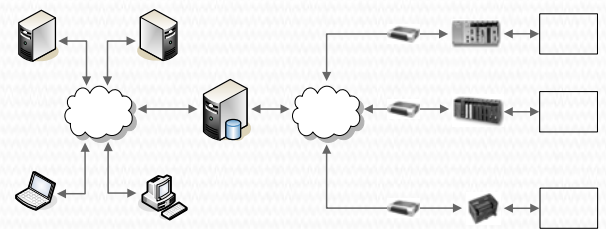


Figure 1.- Hardware Architecture of AquaScan

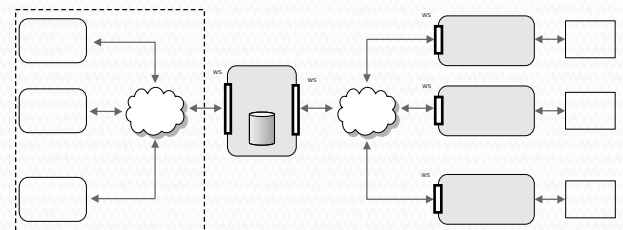


Figure 2.- Software Architecture of AquaScan

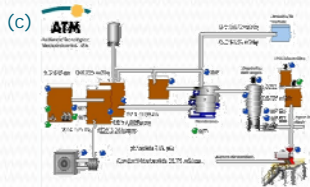
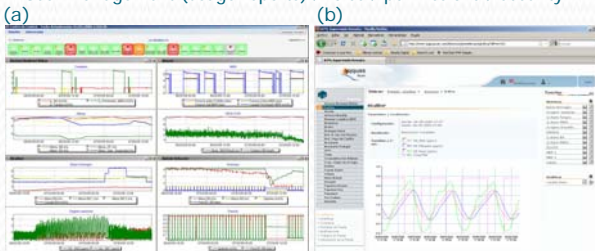


Figure 3.- Examples of AquaScan interfaces: (a) Control-Centre: status of the whole system of WWTPs in a unique screen, (b) Web: some variables and derived variables for one WWTP and (c) current values in the plant synoptic.

SCOPE

1. Multi-Plant. Integrated service from which multiple Industrial Plants can be monitored remotely and concurrently.
2. Multi-User. Effective administration of users so as to unequivocally identify them within the platform guaranteeing the privacy of data collected.
3. Multi-platform. Users should be able to take advantage of this remote service from any device / platform with the only requirement for registered users of having an Internet connection.
4. Integrated Manager of plant information. Storage and friendly access to current and historical (on-line and off-line) data, without limits of time.
5. Independent of WWTP automation hardware. Connectivity with the most common hardware used for control and communication.

INNOVATIVE ASPECTS

Special care has been taken to incorporate the most innovative aspects reported for the flexibility and future applications of the supervision system. Two factors are crucial for success: (1) design of well-formed data structures for the storage of plant information; and (2) implementation of standard network interfaces for providing external applications with remote access to the stored data.

AquaScan has been specially developed for WWTP supervision, so algorithms for relevant derived variables of the plant performance have been already implemented: daily averages, oxygen uptake rate (OUR), oxygen transfer rate ($K_L a$), oxygen transfer efficiency...

COMPETITIVE ADVANTAGES

Not only the variables related to the WWTP can be on-line monitored and stored by AquaScan, but any other parameters or variables of the industrial process automated by a PLC. Thus, the whole industrial activity can be monitored through any device connected to internet (PC, mobile, PDA...).

This system facilitates subcontracting the maintenance and operation of the industrial WWTP by an external company because of the reduced displacement costs.

At present, AquaScan is fully operative and is offering supervision services to several industrial factories.