RCS – Remote Control System

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Data acquisition and processing in the field of building automation is the main application field for the remote control system RCS. Distributed and robust service, including remote access and alarm handling in case of failures are typical tasks fulfilled by this system. Collected data are evaluated and passed on for further data processing and publication.

The RCS, Remote Control System, is a fully custom designed monitoring system consisting of software- and hardware-components for electrical system operation monitoring and state logging. Temperature conditions are recorded and robust heating-control is accomplished based on user-adjustable settings. Additionally, monitoring of electrical facilities, fire-detectors, access control systems and further systems, like the cooling plant for the gravimeter, is accomplished. In case of system failures routines for automatic alarming and limited remote servicing capabilities are implemented for remote control and emergency shutdown.

The system is based on a distributed server-client-structure. The central server is responsible for data collection, generated by the individual clients. A separate software tool automatically transforms the measurement data into an open file format for data exchange into central systems for further data processing.
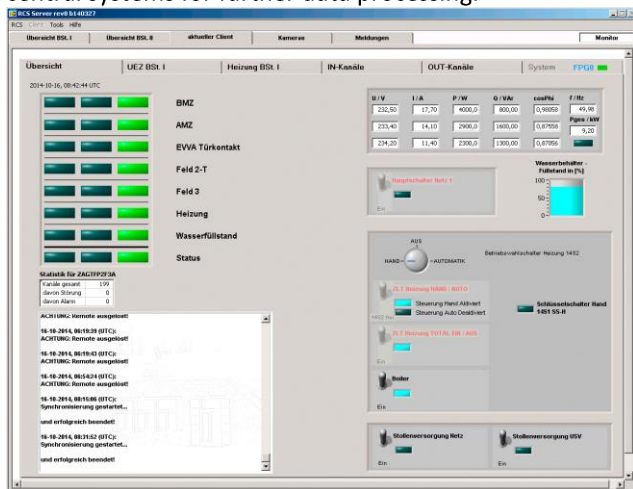

Figure 1: Client Main Screen

The distributed clients, built of embedded systems with input/output-capabilities, are responsible for data sampling and primary data processing. Each channel is sampled and evaluated based on user-controllable criteria concerning the allowed range, in case of analogue signals, and the normal operation state "on"/"off" in case of digital signals. Signals based on digital communication utilizing industrial busses are translated into the common channel format, equivalent to corresponding digital or analogue channels. The result of the evaluation is displayed on the client user interface (see figure 1) as color-coded result: "green" means normal operating state, "yellow" is used for a fault state and, finally, "red" indicates an alarm state. The measurement channels are freely configurable by the end user and so the system is easily adaptable to new monitoring tasks, e. g. in the case of new experiments. For reasons of comprehensibility, every configuration step is recorded; historical measurement data indicating the operational state can be assigned to a specific configuration unambiguously.

All state messages are collected and displayed together on the main system status overview page on the server (see figure 2). In case of an "alarm"-state automatic email notifications are sent; the actual state of the system and the incident history of the last hours are included for remote analysis. Optional voice notification to a fixed range of mobile subscribers is executed, if desired.
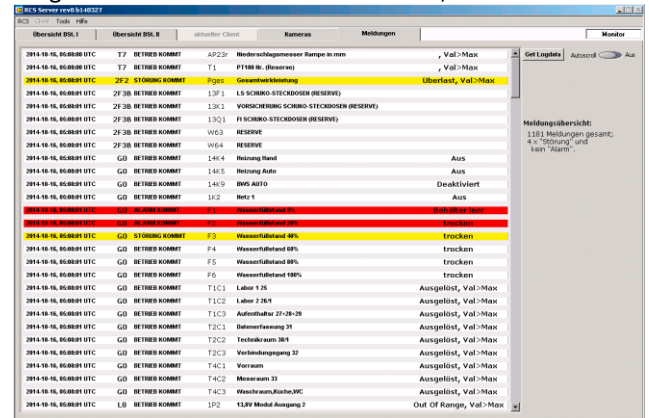

Figure 2: Status Overview

The system was initially developed 2002 and has undergone many expansions since then. A total of 16 distributed clients are installed at the SGO-and GMO-observatories, managing several hundreds of measurement channels operating on a typical sampling time base around two seconds. Together with intelligent data deposit algorithms, the RCS allows complete system monitoring and logging over the years.

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