

## DATA ACQUISITION SYSTEM FOR MONITORING LARGE DAMS BASED ON PLCs

Kovacs Istvan\*, Meza Dan\*, Catana Viorel\*, Nicolae Bojor\*, Alina Calarasu\*

SC IPA SA Cluj-Napoca Subsidiary 109 Republicii Str., 400489 Cluj-Napoca, Romania,  
phone: +40264 596155, fax: +40264 590558, Email: ipacluj@automation.ro

### Abstract

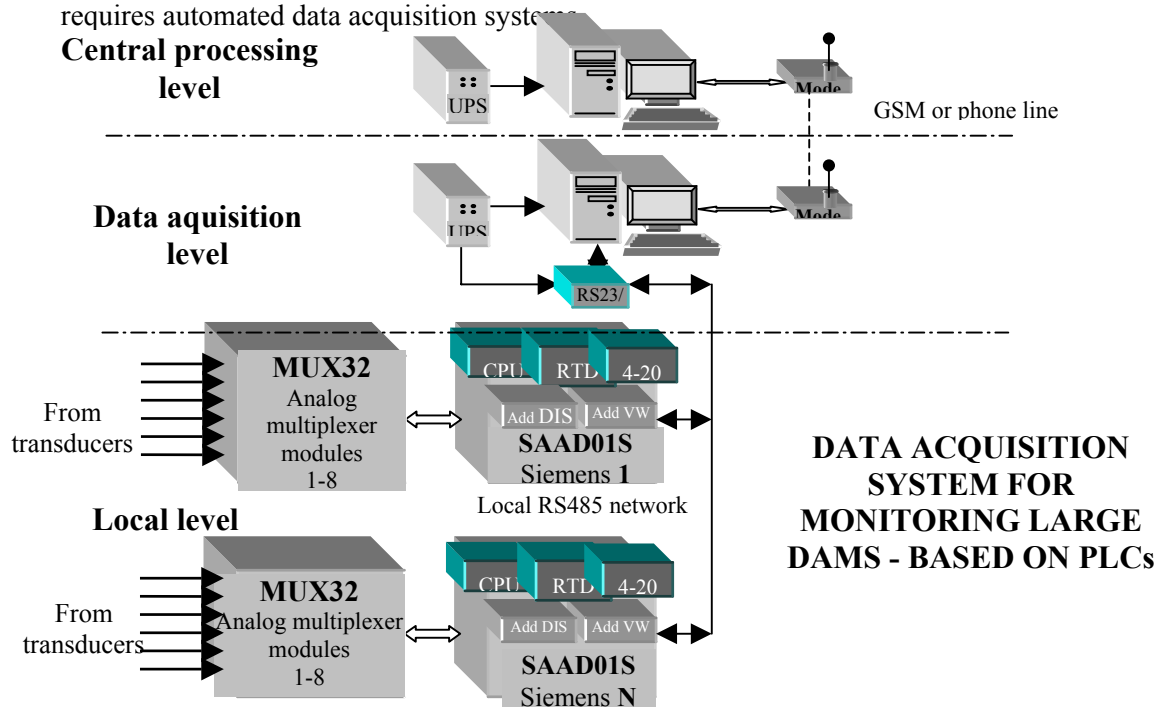
Programmable logic controllers (PLC) are designed for data acquisition and control, but using PLCs for supervising dams is not a very ordinary task. Data acquisition systems for dams collect analog data from several hundreds of transducers at a very slow acquisition rate. Because PLCs have limited number of analog inputs, you can and must use analog multiplexers to connect a very large number of traducers to the PLC steel be cost-effective. Transducers used in dams supervision are not the usual types of industrial transducers because they must be very reliable and because they were placed in the dam a long time ago when the dam was build. Therefor PLCs has no appropriate analog inputs for measuring them. To measure this kind of transducers you must use special interfaces to fit the transducers with the PLC.

**Keywords:** Data acquisition, PLC, large dams supervision , vibrating wire

### 1. INTRODUCTION

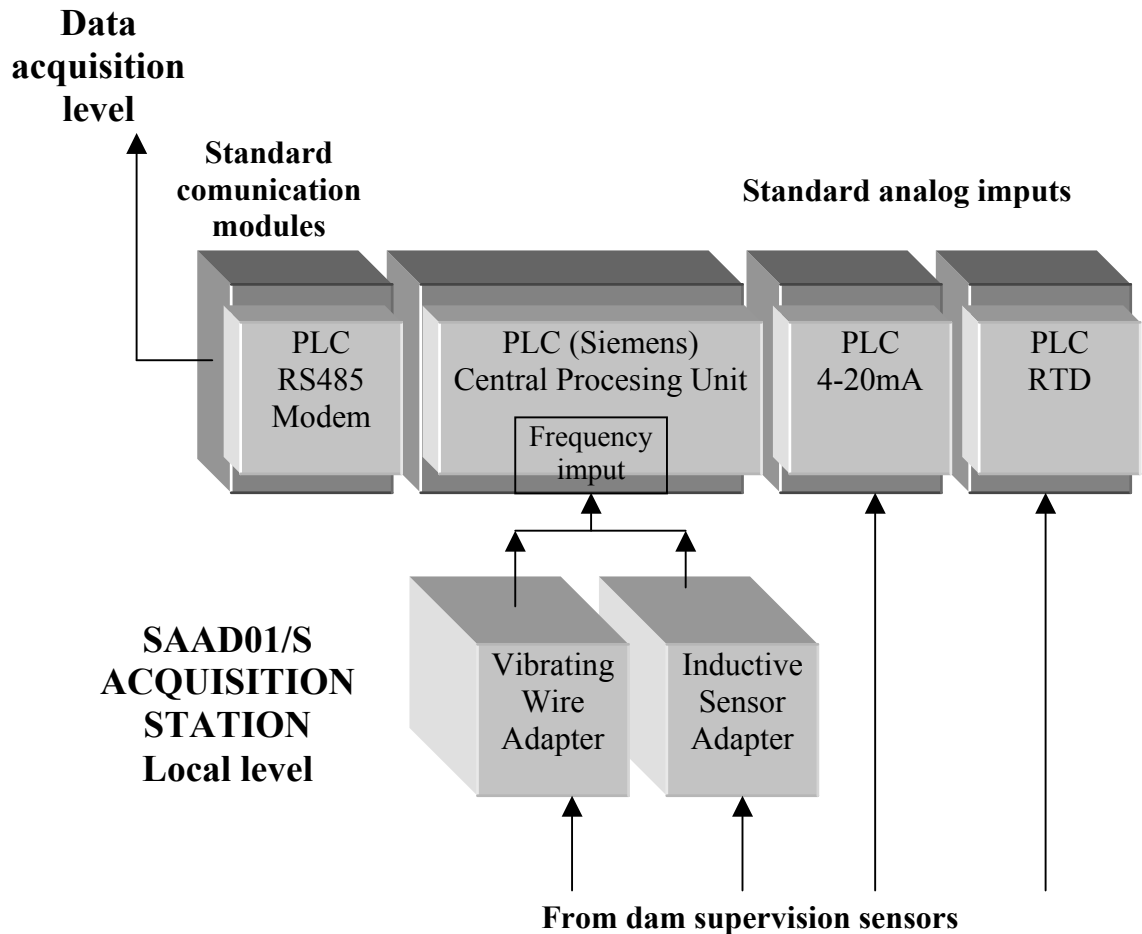
To ensure the safety of large dams, they have hundreds of build-in monitoring instruments for critical parameters such as pressure, deformation, displacement, inclination, ground settlement, rock movements and load.

The collection and analysis of large quantities of data, especially over long distances, requires automated data acquisition systems.



Due to their rugged construction, their communication facilities and their analog inputs PLCs may be used in the local level of the automated data acquisition and processing systems instead of specialized equipments.

PLCs have analog inputs for the usual industrial transducers like RTDs, potentiometric transducers and standardized current and voltage output transducers. Some of the transducers used in dam supervision are not the usual types of industrial transducers. Therefore PLCs have no appropriate analog inputs for measuring them. To measure this kind of transducers we use special adapter interfaces with frequency signal outputs, to fit the transducers with the PLC.



Data acquisition systems for dams are collecting analog data from several hundreds of transducers at a very slow acquisition rate. Slow acquisition rate allows utilization of large multiplexion rate up to hundreds to one made with relays. This is a very cost-effective solution for the system.

Using relays also has other advantages as well:

- Small cross-talk between measuring channels
- High isolation of open channels
- Very low on channel resistance.

## REFERENCES :

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