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IX – 256 – AUTOMATIC WATER QUALITY MONITORING

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Highlights: The objective of the work is to develop an automated sensor system to monitor water quality parameters.

Keywords: Water Quality Monitoring, Multiparameter Probe, Automatic Water Quality Monitoring, Monitoring of Water Bodies

INTRODUCTION

An automatic water quality monitoring system was developed in partnership between Itaipu Binacional, Itaipu Parquetec Itaipu and Companhia de Saneamento do Paraná (Sanepar). The information generated in real time aims to contribute to the management of water resources and the appreciation of the environmental and socioeconomic benefits resulting from the implementation of Sanitary Sewage Systems. The study covers the stages of preparing the sample design, automating sensors, prospecting sources of information, defining and monitoring indicators. The model system consists of a flow cell, in which samples of the water body are captured and water quality parameters are analyzed using the EXO 3 multiparameter sonde.

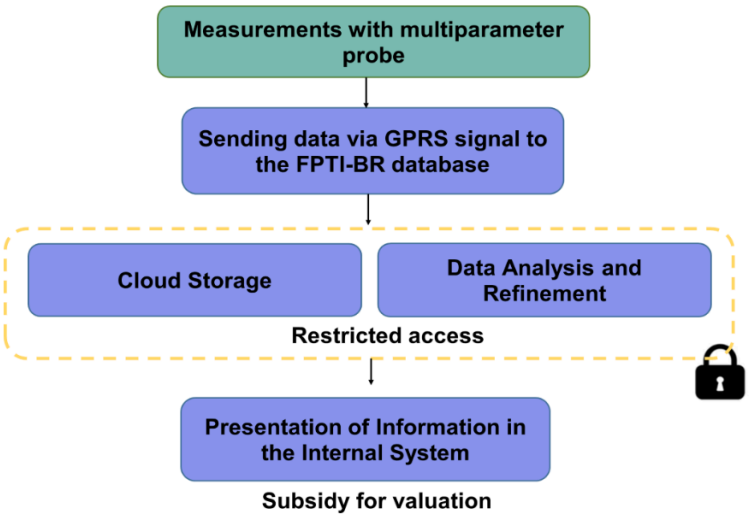
The control and communication system are integrated into the pump drive system, the command to collect water from the water body is carried out through the CR800 controller. The controller performs data acquisition through the mobile telephone network, via GPRS, transmitting data in real time, processing and storing the collected parameter data. This model of automatic monitoring system with a network of sensors brings innovation and technology, allowing the remote obtaining of data and information through a multi-parameter probe to monitor water quality in the water body.

METHODOLOGY

To measure water quality in water bodies located in the Alegria River basin in Medianeira-PR, a flow cell system was implemented to capture water from the water body, using a set of motor pumps. The pump is activated remotely using a controller (CR-800).

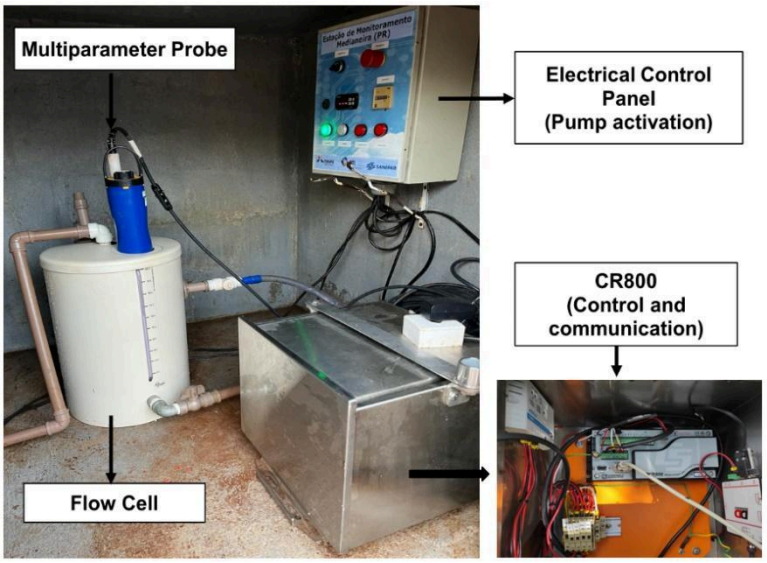
The equipment (probe and pump) is located inside an existing “masonry house” (Figure 1), providing greater safety, reliability and reduced system maintenance costs. The level sensor is installed together with the water intake to be pumped.

Figure 1 – Automatic water quality monitoring system



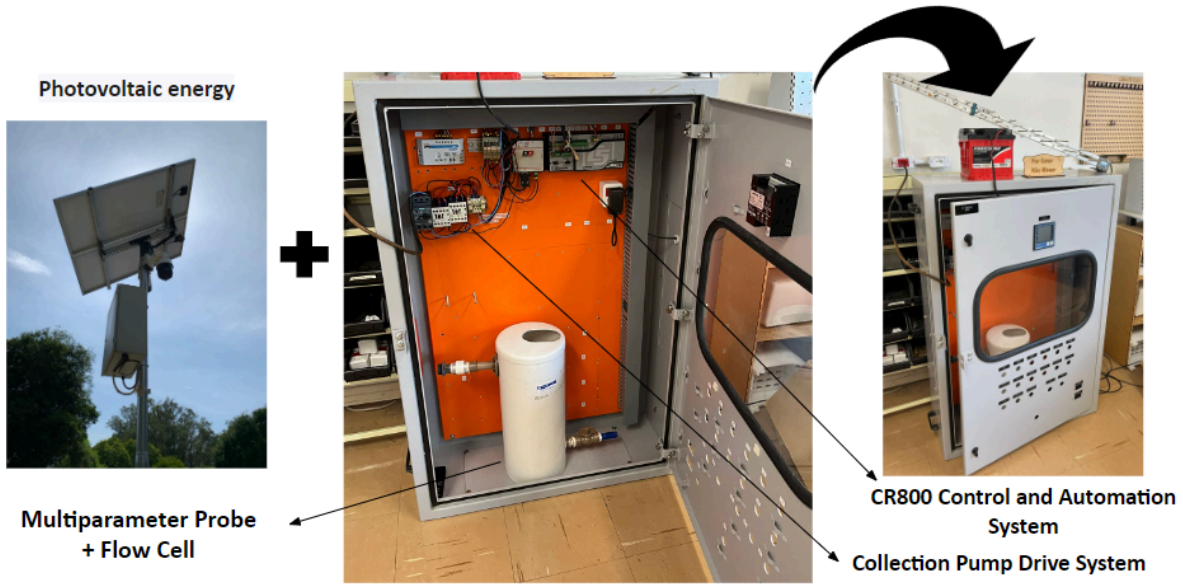
The model automatic monitoring system for measuring physical and chemical parameters of water quality in water bodies is composed of a flow cell, a multi-parameter probe, two booster pumps, a control panel and a traveling cabinet. The probe includes sensors for pH, temperature, oxidation-reduction potential, dissolved oxygen, conductivity, salinity, total dissolved solids and turbidity, performing simultaneous measurements of physical and chemical parameters.

Figure 2 – Flow cell monitoring system.



Currently, the system is installed in a masonry shelter. However, it is in the process of transitioning to a mobile cabinet designed for itinerant campaigns. This new model will provide greater mobility, allowing the system to be transported to different locations.

Figure 3 – Itinerant system for automatic monitoring of water quality in real time.



RESULTS AND CONCLUSIONS

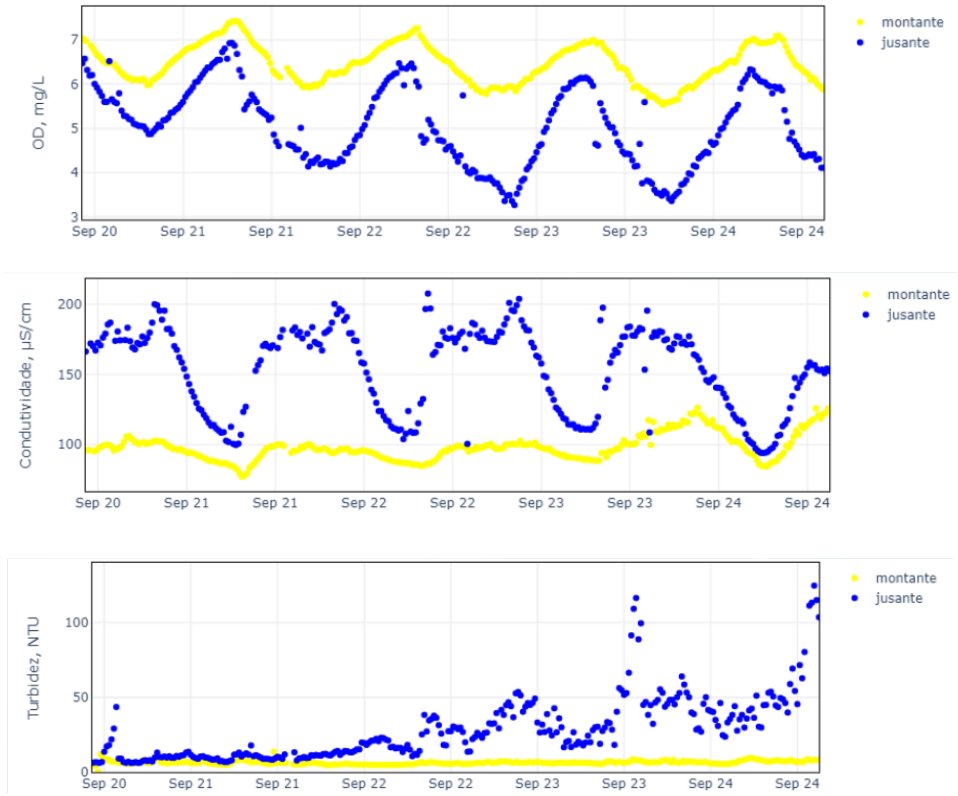
The automatic monitoring system model with sensor network brings innovation and technology allowing the remote obtaining of data and information through a multi-parameter probe to monitor water quality in the water body.

Ultimately, monitoring aims to enable an adequate assessment of water quality. To this end, different configurations can be used in terms of location of monitoring points, frequency and type of monitored parameters. Carried out at strategic points to monitor the evolution of water quality, identify trends and support the development of diagnoses. Furthermore, the results obtained from monitoring allow us to identify places where greater detail is needed.

The itinerant water quality monitoring system can be used in different configurations in terms of location of monitoring points, frequency and type of monitored parameters. Thus, the system provides:

- Reduction in the need for manual sampling;
- Enables the collection and transmission of data in real time, allowing rapid identification of changes in water quality;
- Provides information with sufficient detail to analyze actual water quality fluctuation.
- Contributes to monitoring Launched Load Compliance and Sewerage Standard Compliance

Figure 4 – Water quality data generated by the multiparameter probe.



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