Design, implementation and tuning of an irrigation canal system SCADA

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Abstract: The paper presents the design, implementation and field tuning of the SCADA system of a Portuguese irrigation canal network upstream controlled with AMIL radial gates and equipped with other Neyrpic devices. In addition of the irrigation district and its hydraulic main system, the paper also presents SCADA architecture, including two synoptics, and their remote terminal units (monitoring and control and monitoring units). The SCADA manual controllers – direct, gate position and gate flow controllers - are defined for the main canals and main distributors intakes, in order to permit a pre-defined flow value or a daily flow schedule achievement. SCADA also monitors outflows from the main canals and main distributors - the most important canal top side weirs and canal terminal weirs. The developed manual gate flow controllers were tuned in the field using collected data readings from two types of acoustic Doppler flow meters. The field procedures for tuning the flow controllers and the obtained parameter values are also presented.

Keywords: Canal control, flow controller, flow equations, irrigation canal, local upstream control, SCADA system.

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