

ROMANIA - MARU DAM & HERCULANE DAM PROJECTS



7/05/2006

DELIVERY, INSTALLATION, TRAINING & COMMISSIONING AT FULL FUNCTIONAL CAPACITY OF A WATER LEVEL MONITORING SYSTEM AT MARU DAM AND HERCULANE DAM IN ROMANIA

This project's objective is the delivery, installation and finishing at full functional capacity of the equipment of measuring the water level at the Maru Dam and Herculane Dam in order to supply on-line water level data at the dam, both locally on the spot and to a distant center.

ETA Automatizari Industriale conducted an assessment at the location of both dams together with the GSM and satellite communications operators. The Geographic coordinates of the 2 locations have been measured in order to find the optimal data communications solutions. GSM signal level measurements have been conducted.

The existing facilities in which the new equipment was installed were assessed for their capabilities to offer cable connection for data transmission and utilities, data transmission to the Central Control Room and wireless transmission to SH Caransebes. The information received from the two points will be transmitted to the computer network in function at SH Caransebes and in a database.

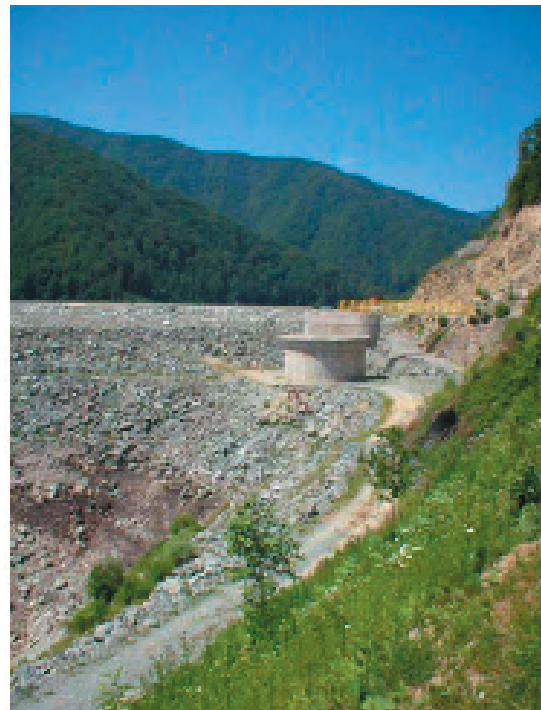
The assembly of the system started at September 8th 2003 and the finishing at the dams was done in full on September 24th 2003. At the same date were done communications tests.

Lake Maru is located 25 miles from Caransebes. The equipment of measuring the water level at the Maru Dam is located on the right side of the dam, and the measuring is done through a metal pipe located inside the drawing-off well of the dam, up-stream connected.

The Lake Herculane is located at 50 miles from Caransebes. The water level measuring equipment at the Herculane Dam is located also on the rightside of the dam, and the measuring is done through a metal pipe located inside the dam.

This system was needed for the prompt evaluation of the water level, for an increased security in functioning and for the accuracy of the data collected and organized in a data base. Was foreseen the future possibility of prediction of the evolution of the water level, coordinated with the optimal working level and efficiency of the hydro-equipment.

In this project, ETA Automatizari Industriale has used sensors from the Swiss company Rittmeyer and dataloggers from the American Company SUTRON – a well known name in telemetry, especially in hydrology. SUTRON is world leader in this field, having built many major projects similar to this one around the world.



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PURPOSE: Provide extensive Met System including 100 Automatic Weather Stations and Receive Site to replace existing monitoring and warning system

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FIG. 2 – HERCULANE DAM (LEFT – THE OLD MEASURING SYSTEM; RIGHT – THE DAM. DOWN, THE VALVE).

Sensors

In the 2 cases with the measuring range of 72 m, and 27 m respectively, for the measuring level was required an accuracy of 1 centimeter. This level of accuracy was accomplished by using submersible pressure sensors with a domain of 20 meters water column (30 psi) and a preciseness of 0,05%. This represents in this domain to 1 cm.

The sensors have a digital communication standardized protocol: SDI-12. This protocol has a public status and it is used by many environmental sensors and dataloggers producers. On a fascicle of wires up to 10 sensors may be connected. The sensors are provided with high tension protection and an anti-humidifier device to prevent condensing on the pressure equalizer tube.



Datalogger

The controller used in this project is made by SUTRON: XLite 9210-0000. This controller is completely programmable, using the Windows CE computing system; has a display LCD, 3 interface serial RS-232 and one RS-485. For interconnecting with the submersible sensors, Xlite has an interface SDI-12. On the serial interface 3 is connected the modem GSM MC35 Terminal. The Controller manages the pressure readings at programmed intervals and the data communication through GSM/CSD to the LAN of SH Caransebes. The readings are displayed on site as well on the LCD monitor of 2 x 20 characters.

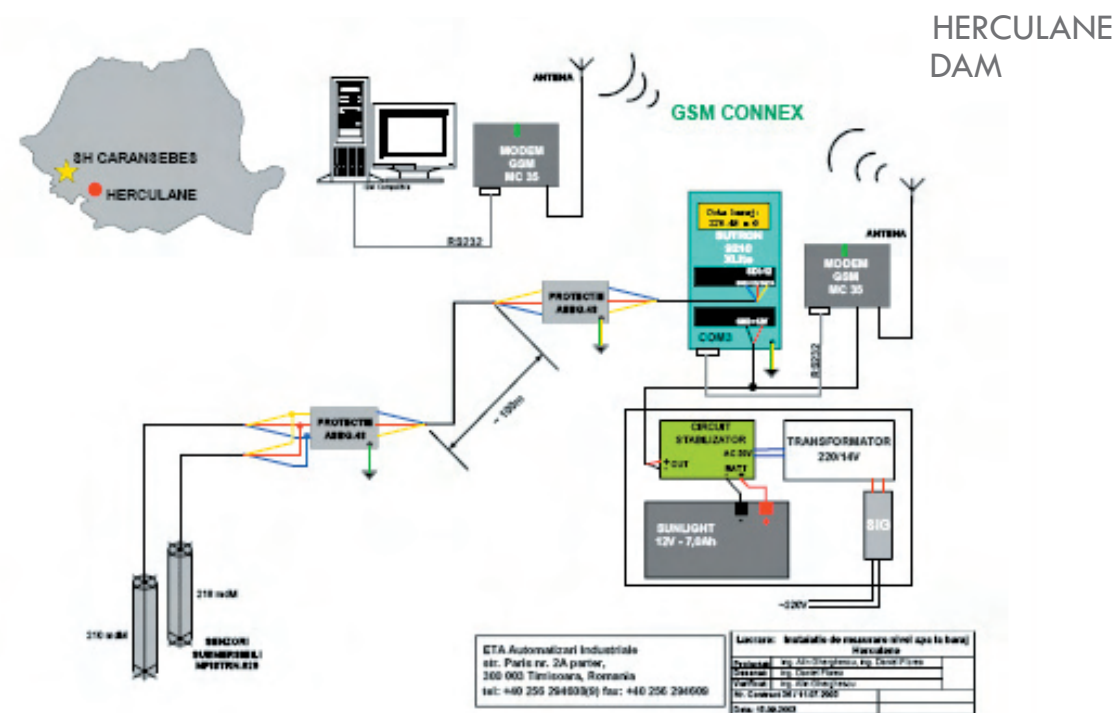
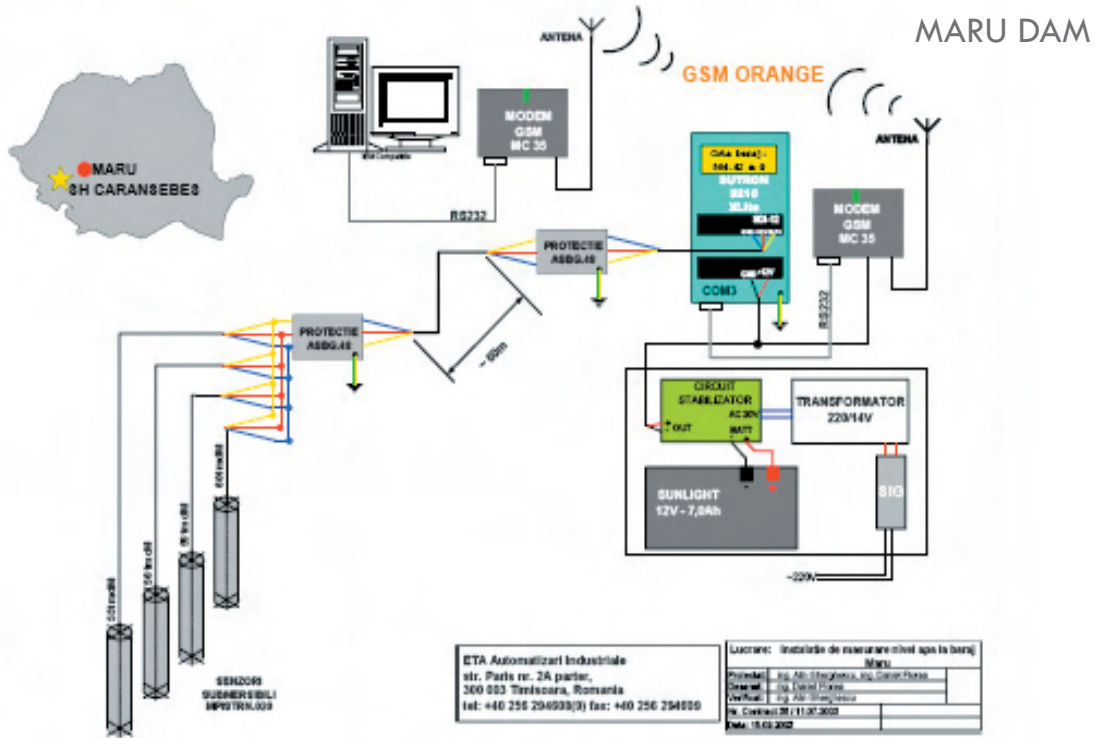
The communication fascicle of cables SDI-12 allows the installation of the controller at remote distance from the submersible sensors. This distance might be according to the standards of over 70 meters (~ 200 feet). The whole controller has a small electricity (power) consumption, so may get power supply from electric batteries. In this case we used a system with storage buffer battery connected to the power network (220 V), with protection towards random fluctuations.

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SUTRON



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FIG. 4 - DATALOGGER 9210 XLITE, SUPPLY AND BATTERY BOX, MODEM SIEMENS MC35T. (HERCULANE DAM)

WIRELESS CONNECTION

In order to acquire the connection with the data loggers we used GSM industrial modems, type Siemens MC35 Terminal. In order to obtain a steadfast communication we used antennas type Sirio SPB-918-10, with good results.

APPLICATION IN LAN SH CARANSEBES

ETA Automatizari Industriala has delivered an application which was installed on the server existing at SH Caransebes head quarters and which makes available to the network the data regarding the water level. Added to that the information will be stored in a data base MS

Access or in any other ODBC data base. This application may automatically access the data from dataloggers (in a possibly pre-established time frame).



Fig. 3 - OVERVOLTAGE SENSORS PROTECTION



FASTENING SYSTEM - HERCULANE DAM



FIG. 5 SUPPLY AND BATTERY BOX



SIRIO ANTENA (MARU DAM)

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SYSTEM RUNNING

The SUTRON Datalogger allows easy set-up of the sensors and the programing of the water level measuring intervals. It also offers an algoritm of displaying and transmission of water level, according with the measuring range of each sensor. The results of the measurements are saved in a .log file in the datalogger's memory. The application from the SH Caransebes head quarter is collecting these data from the datalogger (in a pre-established time frame) and save them in a data base.

ETA Automatizari Industriale is active on Romanian IT market and has experience in designing, developing, and implementing SCADA systems for public utilities industry. More tan 200 SCADA systems developed by our company are running the industrial thermal processes of the thermal energy suppliers in the following cities: Timisoara, Cluj-Napoca, Arad, Oradea, Deva, Alba-Iulia, Sannicolau Mare, Pitesti, Iasi (of an ~ total population of over 3,000,000).

Our SCADA solution (based on the OPC standard) have been chosen by S.C. Electrica S.A. FDFEE "Electrica Banat" S.A. for the remote control operation of the re-connectors from SDFEE Timisoara, SDFEE Arad, SDFEE Resita and SDFEE Deva. In this projects our company has used a technological mix in order to ensure the communication: GPRS and trunking radio stations.

ETA Automatizari Industriale has already a good history of cooperation S.C. Hidroelectrica S.A., developing till now two important projects. At the Subsidiary Hidrocentrale Targu Jiu, ETA Automatizari Industriale has supplied a SCADA solution, modern and standardized (using the OPC servers) for the monitoring of 7 hydro-electric power plants. In that project

the data communication is done through wireless technology: 2.4 GHz and radio at 430 MHz.

At the Subsidiary Hidrocentrale Caransebes, ETA Automatizari Industriale has implemented the hereby mentioned system of measuring of the water levels at the Maru and Herculane Dams, integrating successfully high accuracy and fiability equipments: Rittmeyer (Switzerland) level sensors and SUTRON (SUA) controllers.

Starting 2002, ETA Automatizari Industriale is the exclusive representative in Romania of the German company EYEVIS GmbH – producer of the systems type video wall for control rooms – and has implemented other important projects in our country. ETA Automatizari Industriale has developed recently couple of important projects in the field of equipment installed at the control rooms at electric power control centers in the country.

Our company has installed video wall systems – data display on wide surfaces, with DLP cubes (Digital Light Processing) for the control rooms of S.C. Hidroelectrica S.A. Subsidiary Hidrocentrale Targu Jiu and S.C. Electrica S.A. F.D.F.E.E. "Electrica Banat" S.A.

Assessing the positive results of our company in the monitoring, tele-reading and remote control operation projects S.C. Hidroelectrica S.A. has granted us the status of agreed supplier. Starting the year 2003, ETA Automatizari Industriale is certified according to quality standard ISO 9001:2000.

Translated By Constantin Barba

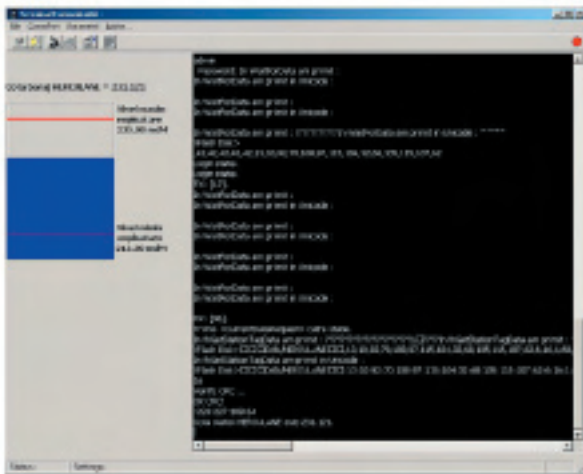
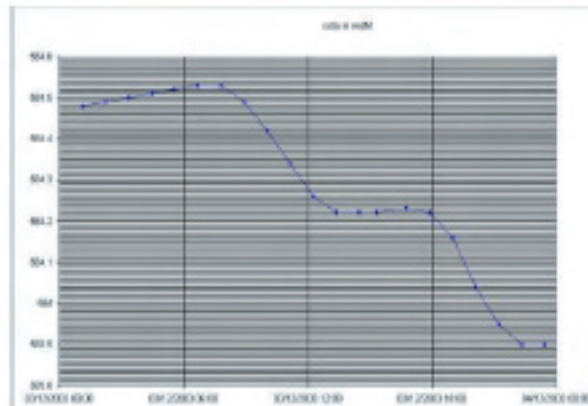


FIG. 7 – APPLICATION INSTALLED ON MAIN SERVER



WATER LEVEL READINGS IN 24 H (MARU DAM)