

TELEMET

A TELEMETRY, CONTROL AND ALARM MANAGEMENT SYSTEM FOR ENVIRONMENTAL APPLICATIONS

In the near future most of the Portuguese WasteWater Treatment Plants (WWTPs) will serve small urban communities, with less than 2 000 inhabitants. This is also true for the other European countries.

Likewise, most of the Water Treatment Plants (WTPs) also serve small communities and, at least in Portugal, it's not uncommon for one municipality to have more than ten WTPs each one serving less than a thousand inhabitants.

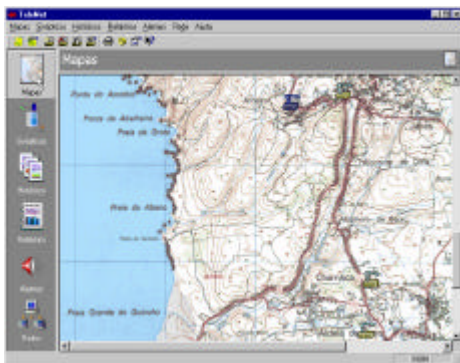
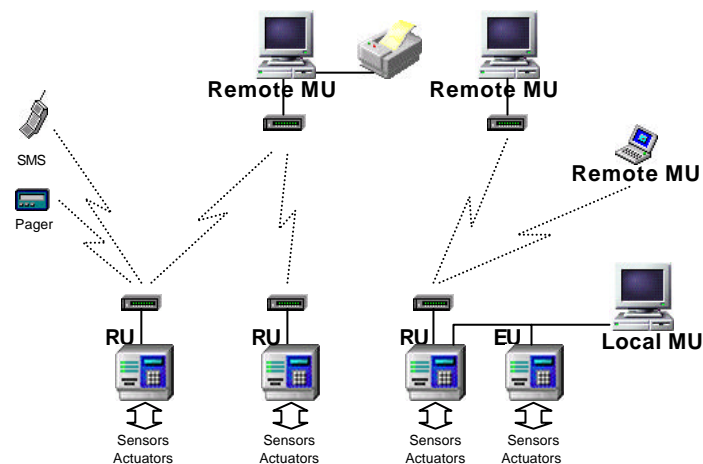
It is a known fact in Portugal that due to the difficulties in hiring the necessary qualified personnel, most of these plants are operated/managed by over requested technicians who have to attend to other tasks at the same time. It's, therefore, necessary to conceive and implement strategies to face this problem.

The same needs and difficulties can be found in the case of industrial WTPs and WWTPs installed in factories without integrated automation systems.

THE GLOBAL SYSTEM

TELEMET is an integrated telemetry, control and alarm management system specially designed to enable the remote operation/management of these plants with a small installation and exploration cost. In this way, the person responsible for the operation of these infrastructures has the opportunity to remotely analyse the more important parameters and tune the implemented control strategies. The remote operator can also define a set of alarms and the ways to be notified, all without the need of repeated visits to the plant.

TELEMET is an open system, running under Windows 95/NT, easily configurable, expansible, low cost already with several installations running.



Like any conventional SCADA system, the global system, schematically represented in the picture, is composed of one or several Management Unit (MUs) and several Remote Units/Expansion Units (RUs/EUs). It's, therefore, possible to monitor a single plant or a group (network) of plants.

Logically, the RU is defined as a collection of "objects" like channels, alarms, modem, etc. Each object is entirely configurable remotely from any MU without the kind of programming required by a standard PLC, demanding only the selection of the appropriate parameters.



The RUs/EUs installed in the plants are real-time systems with:

- Local interface through liquid crystal display (LCD) and keyboard;
- Data acquisition of analog and digital signals on a programmable time intervals. Local data storage memory;
- Simple standard and dedicated control loops implementation (PID, ON/OFF and time controllers);
- Alarm management from analog and digital data with programmable timings. Send alarm notifications to pagers and cellular phones (short messages); Local, remote or automatic alarm acknowledge;
- Event log of operations and alarms;
- RS485 interface for local communication network;

Remotely, the MUs can communicate only with the RUs and use PSTN or GSM modems. This allows for the distribution of the operation/management of the network of plants between different places according to geographical or functional (maintenance, management, billing) criteria and for possibility to monitor any plant from a portable computer equipped with a modem. On the other hand, the local network connection allows for the installation of a local management unit if necessary.

Integrating all these functionalities in one single unit (RU) simplifies the installation and reduces the cost in comparison to other commercial solutions.

Table 1 –Remote Unit/Expansion Unit Features

Digital Microprocessor
64 kB EPROM and 512 kB RAM
Battery supported Real Time Clock (RTC) and Y2K ready
24x2 Liquid Crystal Display and 12 key keyboard
2 serial ports (one RS232C and one RS485)
8 16-bit voltage (0-5V, 0-10V) or current (0-20mA, 4-20mA) analog inputs and 4 analog outputs
16 opto-isolated digital inputs and 16 Darlington digital outputs
220V a.c. or 24 V d.c power supply
IP67 enclosure

The MU implements the following configuration functions:

- General network and individual unit configuration and parameterisation;
- Real-time monitoring of analog and digital data over process synoptic and trending windows;
- Data gathering and processing;
- Report creation and printing;
- Centralised alarm notification handling;

