

## ASPECTS REGARDING THE DATA LOGGERS FOR A GROUND-WATER MONITORING SYSTEM

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### Abstract:

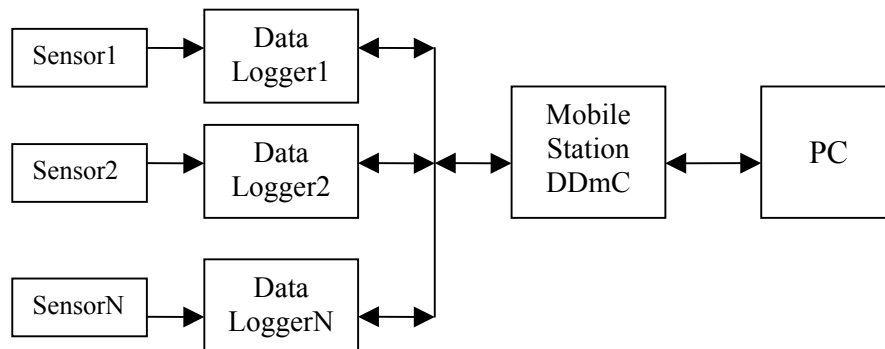
The system was developed for long-term monitoring of ground-water wells as part of a national monitoring program. The system includes a lot of Data loggers placed into the boreholes, a portable hand-held unit, specialized software on PC.

A data logger is an electronic recording instrument that monitors and reports various changes in environmental conditions over time. They are stand-alone devices and must have a robust design to resist aggressive media.

### DESIGN AND CAPABILITIES

This data logger continuously records water level and optional temperature and conductivity in 150mm (or larger) diameter monitoring well.

The simplified design lends itself to easier application and interfacing with the mounted sensors and the mobile station.



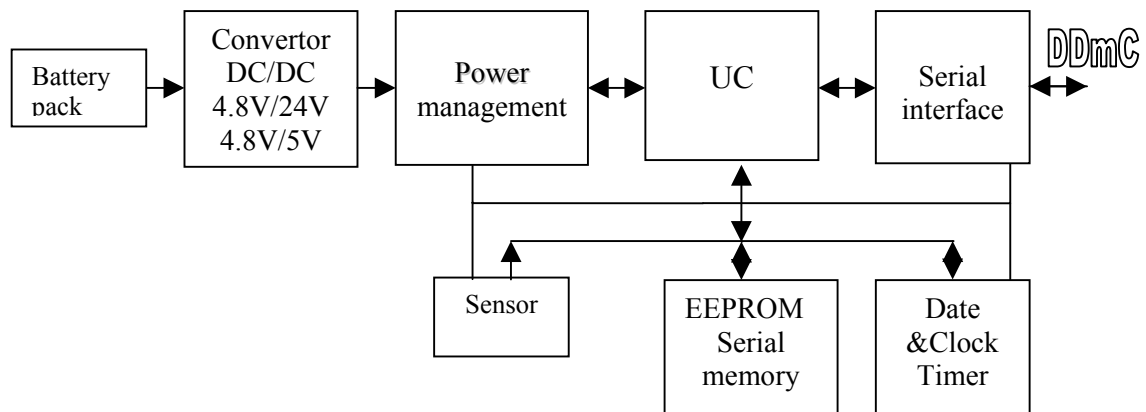
**Fig. 1 In system data logger integration**

The low power consumption is the real problem for such stand-alone devices:

- The controlling microcomputer is a high performance Microchip PIC16F773
- A real time clock runs independently at low power and at the sampling period wakes up from sleep the microcontroller who makes run the step-up converter (4.8V->24V dc) for supplies the sensor
- After stabilize the value provided from the pressure sensor, the real time circuit wakes-up the fly-back converter (4.8V=>5Vdc) and the board is supplied
- The microcontroller reads the samples, reads the time from the same real time

clock, read the battery value, pack all the information and write the a dated record in a small, serial EEPROM memory. Then all goes on stand-by again

- Analog input is current 4-20mA and voltage 0...5V.
- A logger channel can be adapted for virtually any type of sensor by simple interchanging a small internal sensor card.
- The drilling well data logger is in an environmentally protected enclosure, stainless steel housing waterproof.



**Fig. 2 Block diagram of the data logger**

The mobile station DDmC is a battery operated, field portable instrument. It is a typical device for data acquisition, internally equipped with a 80C552 microcontroller and SRAM (with battery) for large data storage. On the front panel LCD display and 4 keys. An easier software MENU realize the principals function:

- identified the data logger
- configured the sampling frequency to the data logger
- set the clock and the data of the data logger
- realize the calibration
- download the record data from data logger and to the PC

After collect records to a computer a specialized software (HIDROSIS) analyzes and monitors several locations.

## CONCLUSION

The needs are for improved monitoring of ground water and build long-term data records for statistical analysis, with the help of data loggers. Also to developed low power technologies very important today in all the activities.

## 5. REFERENCES

- [1] \*\*\* - Data sheets for Data loggers from companies:
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  - Evidencia , League City, Texas, USA
  - H MEINEKE AB (CDL-B) Germany
  - Burge enviromental Tempe, Arizona, USA